Collis, Inc. – Semi-Annual Long Term Monitoring (LTM)

2019 Second-Half Semi-Annual LTM Summary Report- DRAFT

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RCRA
587482

Site Name: Collis, Inc.
Clinton, Iowa
Corrective Measures Implementation - Long Term Monitoring
U.S. EPA ID #IAD047303771

Prepared by: Cindy Lang, BB&E, Inc.

BB&E, Inc. (BB&E) is pleased to provide this 2019 Second-Half Semi-Annual Long-Term Monitoring (LTM) Summary Report. This report documents the second semi-annual LTM sampling event of 2019 conducted September 9, 2019 through September 10, 2019 at the Collis Facility (Site) located at 2005 South 19th Street in Clinton, Clinton County, Iowa (**Figure 1** and **Figure 2**). The Site includes an industrial manufacturing plant and covers an area of approximately 12.5 acres. A detailed summary of the operational history of the site, environmental setting (e.g., land use, topography, site geology and hydrogeology), historic environmental investigations completed, and the sources and extents of known contamination can be found in the USEPA approved *Final Corrective Measures Study Report* (CMS), dated April 24, 2018 (BB&E, 2018).

The CMS includes recommendations for soil land use controls (LUCs)/institutional controls (ICs). Because contamination remains in groundwater on-site and off-site at concentrations exceeding United States Environmental Protection Agency Maximum Contaminant Level (U.S. EPA MCL) criteria, resource-use restrictions via on-site and off-site Environmental Restrictive Covenants (ERC's) was developed. The ERCs restrict impacted properties from residential use and prohibit groundwater access and consumption. As noted in the *Revised Final Corrective Measures Implementation – Long Term Monitoring Work Plan* (CMI-LTM WP; BB&E, 2019a), which was

submitted to, and approved by the U.S. EPA, the CMS included recommendations for LTM of groundwater, in addition to the ERC's, including semi-annual groundwater monitoring for five years. Following the five years of semi-annual LTM, an evaluation will be conducted to determine the effectiveness of the monitored natural attenuation (MNA) groundwater remedy. Additionally, due to residual contamination in subsurface soils (2-10 feet below ground surface [bgs]) above U.S. EPA screening levels, a Media Management Plan (MMP) was developed to protect construction workers from exposure to subsurface contamination (BB&E, 2017). The MMP includes inspection and maintenance requirements for the gravel lot located north and northeast of the main facility building; specifically, the gravel lot will be maintained as an effective barrier to protect against direct contact with impacted subsurface soils as a result of erosion and normal use of the gravel surface cover. The gravel lot is to be inspected semi-annually to determine if it is functioning as intended and if maintenance is required. The MMP was submitted to, and approved by the US EPA, and included inspection and maintenance requirements for the gravel lot located north and northeast of the main facility building.

On February 25-27, 2019, thirty-one monitoring wells and piezometers were abandoned at and in the vicinity of the Collis facility. The monitoring wells and piezometers that were abandoned were no longer utilized, and, as agreed upon during the October 24, 2018 meeting at Region 7 between the USEPA and Collis, were to be properly abandoned to minimize long-term environmental liabilities. Abandonment activities are documented in the *Final Summary Report for 2019 Monitoring Well Abandonment Activities* (BB&E, 2019b).

Following the February 2019 monitoring well abandonment activities, the CMI-LTM WP was revised, and approved by the USEPA on 8 May 2019, to the Revised Final CMI-LTM WP in order to reflect the changes in monitoring wells present at and in the vicinity of the Collis site.

This report has been prepared in accordance with the Revised Final CMI-LTM WP (BB&E, 2019a) and the *Quality Assurance Project Plan* (QAPP; BB&E, 2014).

The objectives for field activities completed during execution of the 2019 second-half semi-annual LTM event consisted of the following:

- Groundwater elevations were taken from relevant monitoring wells and piezometers, as defined in the Revised Final CMI-LTM WP, in order to develop potentiometric surface maps to continue to monitor and evaluate the extent of the groundwater interface with Manufacturer's Ditch and groundwater flow direction.
- Groundwater samples were collected for analysis to monitor concentrations of contaminants of concern over time.
- Groundwater monitoring was conducted to observe natural attenuation parameters and concentrations of chlorinated volatile organic compounds (CVOCs). MNA parameters included methane/ethane/ethene, iron, manganese, chloride, sulfate, nitrate and nitrite; these MNA parameters were selected in order to demonstrate the status of the MNA remedy at the Site.
- A gravel lot inspection was conducted in accordance with the 2017 MMP (BB&E, 2017) to identify areas where the gravel was worn down, erosion was occurring (e.g., deep potholes), animals were burrowing, and/or ponding was occurring, and determine if any maintenance of the lot was required.

2019 SECOND-HALF SEMI-ANNUAL LTM MONITORING SUMMARY

This 2019 second-half semi-annual LTM summary report contains a summary of groundwater analytical results (**Table 1**), a summary of groundwater elevation results (**Table 2**), groundwater field parameter readings (**Table 3**), Vapor Intrusion Screening Level (VISL) comparisons (**Table 4**), MNA results (**Table 5**), detections summary figures (**Figures 3**, **4**, **5**, and **6**), potentiometric surface maps (**Figures 7** and **8**), groundwater concentration trend graphs for key monitoring wells (**Graphs 1**, **2**, and **3**), laboratory analytical data (**Attachment A**), field notes/forms (**Attachment B**), and the gravel lot inspection (**Attachment C**).

The 2019 second-half semi-annual LTM activities are summarized below:

- Groundwater samples were collected from specific site monitoring wells, as described in the Revised Final CMI-LTM WP. Groundwater analytical results are summarized in **Table 1**, and sample locations are shown on **Figure 2**.

- Groundwater samples from the first saturated unit (a shallow unconfined aquifer) were collected from MW-38, MW-39, MW-50S, PZ-47 and PZ-48 and analyzed for volatile organic compounds (VOCs; U.S. EPA Method 8260).
- Groundwater samples from the second saturated unit (upper unconsolidated sediments and weathered bedrock) were collected from MW-34, MW-45, MW-47S, MW-50, and MW-56 and analyzed for VOCs (U.S. EPA Method 8260). Additionally, MW-34 was sampled and analyzed for MNA parameters (chloride, nitrate/nitrite, sulfate/sulfide, dissolved iron, dissolved manganese, methane, ethane, and ethene). Monitoring wells MW-34 and MW-45 were also sampled and analyzed for 1,4-dioxane (U.S. EPA Method 8260SIM).
- Groundwater samples from the third saturated unit (lower unconsolidated sediments and upper bedrock) were collected from MW-42 and MW-53 and analyzed for VOCs (U.S. EPA Method 8260), 1,4-dioxane (U.S. EPA Method 8260SIM), and MNA parameters (chloride, nitrate/nitrite, sulfate/sulfide, dissolved iron, dissolved manganese, methane, ethane, and ethene).
- A groundwater sample from the fourth saturated unit (bedrock) was collected from MW-43 and analyzed for VOCs (U.S. EPA Method 8260).

- Groundwater field parameters, including oxidation-reduction potential (ORP), dissolved oxygen (DO), specific conductivity, turbidity, and pH, were collected from monitoring wells during purging, and prior to sample collection, at approximately 5-minute intervals. Groundwater field parameters were collected to determine when stabilization had been achieved and a groundwater sample could be collected. A groundwater sample was collected when field parameters had stabilized for three successive readings or when 45 minutes of purging had been completed. Prior to sample collection, a final reading of the field parameters was recorded. The following stabilization criteria were used:
  - ± 0.1 Standard Unit (S.U.) for pH
  - ±3 percent (%) for specific conductance (millisiemens/centimeter [mS/cm])
  - ±10 millivolts (mV) for ORP
  - ±0.3 milligrams per liter (mg/L) for DO
  - ±0.5 Degrees Celsius (°C)
  - ±10% for turbidity values or less than (<) 50 Nephelometric Turbidity Units (NTUs)

Groundwater field parameters were used to enhance the dataset for evaluating the effectiveness of the MNA groundwater remedy in accordance with the *Natural Attenuation of Chlorinated Solvents in Groundwater: Principles and Practices* (Interstate Technology and Regulatory Council, 1999) guidance document.

- In accordance with the Revised Final CMI-LTM WP all purge water generated was disposed of directly at the waste water treatment plant inside the Collis Facility. All sampling gloves and other personal protective equipment was double-bagged and placed in an on-site municipal waste container for disposal.

DEVIATIONS FROM THE REVISED FINAL CMI-LTM WP

Deviations from the Revised Final CMI-LTM WP experienced during the 2019 second half semi-annual LTM event included the following:

- All samples were collected with a peristaltic pump due to multiple equipment malfunctions with the bladder pump compressor and controller. The peristaltic pump still utilizes the low-flow sampling methodology, as required in the QAPP (BB&E, 2014).

GROUNDWATER ELEVATION SUMMARY

Monitoring wells/piezometers that are screened in four different saturated units, as described in the Revised Final CMI-LTM WP, were gauged during the 2019 second-half semi-annual LTM event. Potentiometric surface maps for the first and second saturated units are included in this report as **Figures 7** and **8**. Potentiometric surface maps were not prepared for the third or fourth saturated units as only two and one data points, respectively, are available for these saturated units. A summary of groundwater elevation and flow information is summarized below:

- Historically, groundwater in the first saturated unit, a shallow unconfined aquifer, flows northwest to north-northwest. Groundwater in the first saturated unit appears to vent to Manufacturer's Ditch. As shown on **Figure 7**, the groundwater flow direction in the first saturated unit, was consistent with historic observations.
- Historically, groundwater in the second saturated unit, the upper unconsolidated sediments and weathered bedrock, flows northwest. As shown on **Figure 8**, the groundwater flow direction in the second saturated unit was consistent with historic observations.

- Historically, based on previous potentiometric surface maps, groundwater in the third saturated unit, the lower unconsolidated sediments and weathered bedrock, flows northwest.
- Upon removal of expansion plugs, various monitoring wells were noted to have water slowly flowing to the top and/or over the top of casing indicating artesian conditions consistent with historic observations. Wells exhibiting artesian conditions during the 2019 second-half semi-annual LTM event are identified on **Table 2**.

A summary of groundwater elevations is included as **Table 2** and field notes and forms are provided for reference in **Attachment B**.

GROUNDWATER ANALYTICAL RESULTS

As specified in the Revised Final CMI-LTM WP, groundwater analytical results were compared to U.S. EPA MCLs or the most recent Regional Screening Level (RSLs), if no MCL exists, for the purposes of evaluating the effectiveness of the MNA groundwater remedy. In addition to the MCL or RSL comparison, per the Revised Final CMI-LTM WP, shallow groundwater analytical results for VOCs were also compared to target groundwater concentrations for VISLs. VOC results from the first and second saturated units have been compared to VISL target groundwater concentrations for commercial exposure, calculated using the U.S. EPA VISL Calculator last updated May 2018 (U.S. EPA, 2018). A summary of groundwater analytical results is provided in **Table 1**. Groundwater analytical results compared to VISL target groundwater concentrations for the first and second saturated units are shown on **Table 4**.

All samples were analyzed by ALS Laboratory Group located in Holland, Michigan (a National Environmental Laboratory Accreditation Program [NELAP] approved lab). A complete set of laboratory results is provided in **Attachment A**. Field notes and sample log forms are provided for reference in **Attachment B**.

Laboratory analytical results are summarized below.

VOCs

First Saturated Unit: Monitoring wells MW-38, MW-39, MW-50S, PZ-47, and PZ-48 were sampled and analyzed for VOCs. VOCs detected above screening criteria included cis-1,2-Dichloroethene (DCE), trichloroethylene (TCE) and vinyl chloride (VC).

Cis-1,2-DCE was detected above the MCL in MW-38 and MW-39. TCE was detected above the VISL in the duplicate sample of MW-39. It should be noted that it was not detected in the parent sample at MW-39. VC was detected above the MCL and VISL target groundwater concentration in MW-38, MW-39, and MW-50S.

Additional detections of VOCs in the first saturated unit include low level detections of acetone (MW-38, MW-39, MW-50S, PZ-47, and PZ-48), 2-butanone (PZ-47, and PZ-48), tert-butyl alcohol (MW-50S, PZ-47, and PZ-48), chloromethane (PZ-47), and carbon disulfide (PZ-48); all detections are below applicable USEPA MCLs or USEPA Tapwater RSLs. These VOCs have not historically been present at the site and are not considered site contaminants of concern, and due to their low concentrations in numerous wells, are not anticipated to be indicative of site conditions. These detections are most likely due to cross-contamination, laboratory contamination or other interference. For those reasons, they are not included on the results tables or figures, but are indicated in the laboratory analytical reports in **Attachment 1**.

Analytical results for the first saturated unit are included on **Table 1, Table 4,** and **Figure 3**.

Second Saturated Unit: Monitoring wells MW-34, MW-45, MW-47S, MW-50, and MW-56 were sampled and analyzed for VOCs. VOCs detected above screening criteria included cis-1,2-DCE, TCE, and VC.

Cis-1,2-DCE was detected above the MCL in MW-34 and MW-45. VC was detected above both the MCL and VISL target groundwater concentration in MW-34, MW-45 and MW-50. TCE was detected above both the MCL and VISL target groundwater concentration in MW-34, and above just the VISL target groundwater concentration in MW-45.

Additional detections of VOCs in the second saturated unit include low level detections of acetone (MW-34, MW-45, MW-47S, MW-50 and MW-56), tert-butyl alcohol (MW-47S and MW-50), 2-butanone (MW-45, MW-56 and MW-47S), and chloromethane (MW-34 and MW-47S); all detections are below applicable USEPA MCLs or USEPA Tapwater RSLs. These VOCs have not historically been present at the site, and due to their low concentrations in numerous wells, are not anticipated to be indicative of site conditions. These detections are most likely due to cross-contamination, laboratory contamination or other interference. For those reasons, they are not

included on the results tables or figures, but are indicated in the laboratory analytical reports included in **Attachment 1**.

Analytical results for the second saturated unit are included on **Table 1, Table 4,** and **Figure 4**. A groundwater concentration trend graph for MW-34 is included on **Graph 1**.

Third Saturated Unit: Monitoring wells MW-42 and MW-53 were sampled and analyzed for VOCs. VOCs detected above screening criteria included cis-1,2-DCE, TCE, and VC. All three parameters were detected above the MCL in MW-42. No parameters exceeded screening criteria in MW-53.

Additional detections of VOCs in the third saturated unit include low level detections of acetone (MW-42 and MW-53), 1,1,2-trichloroethane (MW-42), 2-butanone (MW-53), tert-butyl alcohol (MW-53) and 1,2-dichloropropane (MW-42); all detections are below applicable USEPA MCLs or USEPA Tapwater RSLs. These VOCs have not historically been present at the site, and due to their low concentrations in numerous wells, are not anticipated to be indicative of site conditions. These detections are most likely due to cross-contamination, laboratory contamination or other interference. For those reasons, they are not included on the results tables or figures, but are indicated in the laboratory analytical reports included in **Attachment 1**.

Per the Revised Final CMI-LTM WP, results from the third saturated unit were not compared to VISL target groundwater concentrations. Analytical results for the third saturated unit are included on **Table 1** and **Figure 5**. Groundwater concentration trend graphs for MW-42 and MW-53 are included on **Graph 2** and **Graph 3**, respectively.

Fourth Saturated Unit: Monitoring well MW-43 was sampled and analyzed for VOCs. There were no VOC detections exceeding the MCL.

Detections of VOCs in the fourth saturated unit include low level detections of acetone (MW-43); however, this detection is below applicable USEPA MCLs or USEPA Tapwater RSLs. Acetone has not historically been present at the site, and due to the low concentrations in numerous wells, is not anticipated to be indicative of site conditions. These detections are most likely due to cross-contamination, laboratory contamination or other interference. For those reasons, they are not

included on the results tables or figures, but are indicated in the laboratory analytical reports included in **Attachment 1**.

Per the Revised Final CMI-LTM WP, results from the fourth saturated unit were not compared to VISL target groundwater concentrations. Analytical results for the fourth saturated unit are included on **Table 1** and **Figure 6**.

1,4-Dioxane

Select wells in the second and third saturated units were sampled for 1,4-dioxane. MW-34 and MW-45 (second saturated unit) and MW-42 and MW-53 (third saturated unit) were sampled for 1,4-dioxane; however, 1,4-dioxane was not detected in any of the groundwater samples during the 2019 second-half semi-annual LTM event. Analytical results are summarized in **Table 1**.

Vapor Intrusion

Groundwater samples collected from the first and second saturated unit were compared to VISL Target Groundwater Concentrations (**Table 4**). Sample results indicated that the first saturated unit had detections of VC and TCE that exceeded the VISL Target Groundwater Concentration and the second saturated unit had detections of TCE and VC that exceeded the VISL Target Groundwater Concentration; however, historic evaluation indicates that vapor intrusion is not a concern at the Site.

MONITORED NATURAL ATTENUATION (MNA) SUMMARY

MNA analyses was conducted during the 2019 second-half semi-annual LTM event in order to evaluate continued in-situ biodegradation via reductive dechlorination processes.

In accordance with the Revised Final CMI-LTM WP, MW-34, MW-42, and MW-53 were sampled for VOCs, MNA parameters (i.e., nitrate/nitrite, sulfate/sulfide, iron, manganese, methane, ethene, and ethane), and field parameters (dissolved oxygen [DO], oxidation reduction potential [ORP]), and pH). A detailed discussion of these parameters and relative favorability for in-situ biodegradation via reductive dechlorination is discussed below. A summary of environmental conditions supportive of reductive dechlorination for the three wells sampled during the 2019 second-half semi-annual LTM event has been included in **Table 5**.

Groundwater Field Parameters

DO is a measure of oxygen dissolved in a solution. Concentrations less than 0.5 mg/L are indicative of an environment potentially supportive of reductive dechlorination. All three wells (MW-34, MW-42, and MW-53) had concentrations less than 0.5 mg/L (0.32, 0.39, and 0.21 mg/L, respectively), indicating favorable conditions for reductive dechlorination.

ORP is a measure of the electron activity and an indicator of the relative tendency of a solution to accept or transfer electrons. Favorable conditions for natural reductive dechlorination are less than 50 mV with less than -100 mV being optimal. All three wells (MW-34, MW-42, and MW-53) had concentrations less than 50 mV (-65.2, -45.2, and -59.2 mV, respectively), indicating favorable conditions.

The optimal pH range for microbial activity is between 5 and 9. Biological activity is not likely to occur if the pH is below 5 or above 9. All three wells (MW-34, MW-42, and MW-53) exhibited favorable conditions with pH levels of 7.11, 7.19, and 7.36 units, respectively.

Sulfate Anions

Sulfate concentrations are monitored to evaluate the presence of alternate electron acceptors for microbial respiration. Sulfate was detected in all three wells including MW-34 (55,000 µg/L), MW-42 (99,000 µg/L), and MW-53 (35,000 µg/L) at concentrations higher than the optimal level (<20,000 micrograms per liter [µg/L]) for microbial activity. High sulfate levels may compete with the reductive dechlorination pathway.

Iron

Dissolved iron (i.e., ferrous iron) was detected in MW-42 (170 µg/L), MW-53 (510 µg/L), but concentrations did not indicate ideal conditions. Favorable concentrations of iron for in-situ reductive dechlorination are typically greater than (>) 1,000 µg/L. Iron was not detected in MW-34.

Nitrate/Nitrite

Nitrogen, measured as nitrate and nitrite, was not detected in MW-42, MW-53 or MW-34. These results are favorable, as avorable conditions are generally less than 1,000 µg/L.

Degradation-Daughter Products

Cis-1,2-DCE, trans-1,2-DCE, 1,1-DCE, and VC are degradation products of TCE. The presence of these degradation daughter products are positive indications that reductive dechlorination is occurring. VC is the intermediate degradation step prior to the generation of ethene, followed by ethane. All four daughter products (with the exception of 1,1-DCE and VC in MW-53) were observed in all three wells (MW-34, MW-42, and MW-53).

As specified in the Revised Final CMI-LTM WP, groundwater concentration trend graphs were created for key monitoring wells (MW-34, MW-42, and MW-53) in order to evaluate the historical concentration trends of TCE and the degradation-daughter products over time. These concentration trend graphs are included as **Graph 1**, **Graph 2**, and **Graph 3**.

Dissolved Gases

The presence of the degradation products ethene and ethane tend to indicate that the complete destruction of TCE via the reductive pathway is occurring. Ethene was not detected in any of the wells (MW-34, MW-42, and MW-53) and Ethane was only detected in MW-34 (12 µg/L). Elevated methane levels (>500 µg/L) are generally indicative of strong reducing conditions supportive of reductive dechlorination. Methane was detected in all three monitoring wells (MW-34, MW-42, and MW-53); however, concentrations were not suggestive of strong reducing conditions (>500 µg/L).

2019 SECOND-HALF SEMI-ANNUAL LTM EVENT CONCLUSIONS

VOCs

Based on the groundwater monitoring results from the 2019 second-half semi-annual LTM event, VOCs continue to exceed MCLs in certain wells as shown on **Table 1**. Specifically, cis-1,2-DCE, TCE, and VC continue to be detected in groundwater above MCLs at the Site. **Figures 3**, **4**, **5**, and **6** show VOCs detected above MCLs for 2019.

In the first saturated unit, cis-1,2-DCE was detected above its MCL in two monitoring wells (MW-38 and MW-39) and VC was detected above its MCL in three monitoring wells (MW-38, MW-39, and MW-50S). In the second saturated unit, cis-1,2- DCE was detected above its MCLs in two monitoring wells (MW-34 and MW-45), TCE was detected above its MCL in MW-34, and

VC was detected above its MCL in three monitoring wells (MW-34, MW-45 and MW-50). In the third saturated unit, cis-1,2-DCE, TCE, and VC were detected above their respective MCLs in MW-42. In the fourth saturated unit, there were no VOC detections exceeding their respective MCLs. The constituent 1,4-dioxane was not detected in any of the samples.

The additional detections of VOCs at the site include low level detections of acetone, 2-butanone, tert-butyl alcohol, chloromethane, carbon disulfide, 1,1,2-trichloroethane, and 1,2-dichloropropane; all detections are below applicable USEPA MCLs or USEPA Tapwater RSLs. These VOCs have not historically been present at the site, and due to their low, estimated, concentrations in multiple wells, are not anticipated to be indicative of site conditions. These detections are most likely due to cross-contamination, laboratory contamination or other interference. For those reasons, they are not included on the results tables or figures, but are indicated in the laboratory analytical reports in **Attachment 1**. These will continue to be monitored during the next semi-annual LTM event.

Monitored Natural Attenuation

Analytical results and groundwater field parameters from the 2019 second-half semi-annual LTM event were indicative of reductive dechlorination of TCE as evidenced by detections of TCE daughter products including trans-1,2-DCE, cis-1,2-DCE, 1,1-DCE, VC, ethene, ethane, and methane. Measured field parameters (ORP, pH, and DO) were also indicative of reducing conditions conducive to dechlorination.

GRAVEL LOT INSPECTION

As required by the MMP, the gravel lot was thoroughly graded in October 2017 and, at the request of EPA, a survey of the gravel lot was conducted on May 15, 2018 in order to establish a benchmark condition for which semi-annual inspections will be compared to. A figure showing the gravel lot area to be inspected is included in **Attachment C**.

In accordance with the MMP (BB&E, 2017), the 2019 second half semi-annual gravel lot inspection was conducted on September 9, 2019 to evaluate if it is functioning as intended (i.e., to protect against direct contact with impacted subsurface soils) and determine if any maintenance of the lot was required. The gravel lot was inspected for areas where the gravel had been worn down, and evidence of erosion, burrowing animals, poor drainage or ponding, and any deep potholes

(areas with no gravel cover). There were no necessary repairs or areas where replacement of the gravel was necessary during the September 2019 inspection. In accordance with the MMP (BB&E, 2017), if repairs or replacement of the gravel cover are determined to be necessary during any future semi-annual inspections, repairs will be completed within 60 calendar days to continue to protect against exposure to underlying contaminants in the subsurface soils.

The inspection form and photographs taken during the inspection to document the overall condition of the gravel cover throughout the lot are included in **Attachment C**.

FINANCIAL ASSURANCE MECHANISM (FAM)

Based on LTM sampling results to date, site conditions remain unchanged, which does not warrant any updates to the FAM; therefore, the FAM remains unchanged since its preparation in 2018. The FAM will be re-evaluated for potential updates following the 2020 first semi-annual sampling event.

RECOMMENDATIONS

Groundwater monitoring and gravel cap inspections are recommended to be continued on a semi-annual basis in accordance with the Revised Final CMI-LTM WP for a period of five years. The semi-annual LTM sampling and analysis will be conducted in accordance with the U.S. EPA approved QAPP (BB&E, 2014). Gravel cap inspections will be conducted in accordance with the MMP (BB&E, 2017). As noted above, following the five years of semi-annual sampling, an evaluation will be conducted to determine the effectiveness of the MNA groundwater remedy. The evaluation results, with recommendations, will be submitted to U.S. EPA for review. The next semi-annual LTM event is currently scheduled for April 2020.

If you have any questions or comments regarding this report, please contact me at 248-489-9636 ext. 317 or clang@bbande.com.

Sincerely,

Cindy Lang
Project Manager

BB&E, Inc.

cc: Mr. Brian Calhoun – Collis/SSW
Mr. Charlie Denton – Barnes & Thornburg, LLP

Enclosures:

Figure 1 – Site Location Map
Figure 2 – Site Features Map
Figure 3 – Detections Summary First Saturated Unit September 2019
Figure 4 – Detections Summary Second Saturated Unit September 2019
Figure 5 – Detections Summary Third Saturated Unit September 2019
Figure 6 – Detections Summary Fourth Saturated Unit September 2019
Figure 7 – Potentiometric Surface Map First Saturated Unit September 2019
Figure 8 – Potentiometric Surface Map Second Saturated Unit September 2019

Table 1 – Groundwater Data Summary
Table 2 – Water Elevations Summary
Table 3 – Groundwater Field Parameter Readings
Table 4 – Vapor Intrusion Screening
Table 5 – LTM Groundwater MNA Results

Graph 1 – MW-34 Concentration Trends
Graph 2 – MW-42 Concentration Trends
Graph 3 – MW-53 Concentration Trends

Attachment A – Laboratory Analytical Data
Attachment B – Field Notes
Attachment C – Gravel Lot Inspection

REFERENCES

BB&E, Inc. (BB&E), 2014. *Final RCRA Corrective Measures Activities Quality Assurance Project Plan*. August.

BB&E, 2017. *Final RCRA Corrective Measure Activities Media Management Plan.* December.

BB&E, 2018. *Final Corrective Measures Study Report.* April.

BB&E, 2019a. *Revised Final Corrective Measures Implementation – LTM Groundwater Monitoring Work Plan*. April.

BB&E, 2019b. *Final Summary Report for 2019 Monitoring Well Abandonment Activities*. May.

Interstate Technology and Regulatory Council, 1999. *Natural Attenuation of Chlorinated Solvents in Groundwater: Principles and Practices*. September.

United States Environmental Protection Agency (U.S. EPA), 2018. *Vapor Intrusion Screening Level Calculator*. Retrieved from: https://www.epa.gov/vaporintrusion/vapor-intrusion-screening-level-calculator. May.

FIGURES

Figure 1

Site Location Map

Collis, Inc. Manufacturing Facility
Clinton, Iowa

BB&E

JMP - 04/12/2012

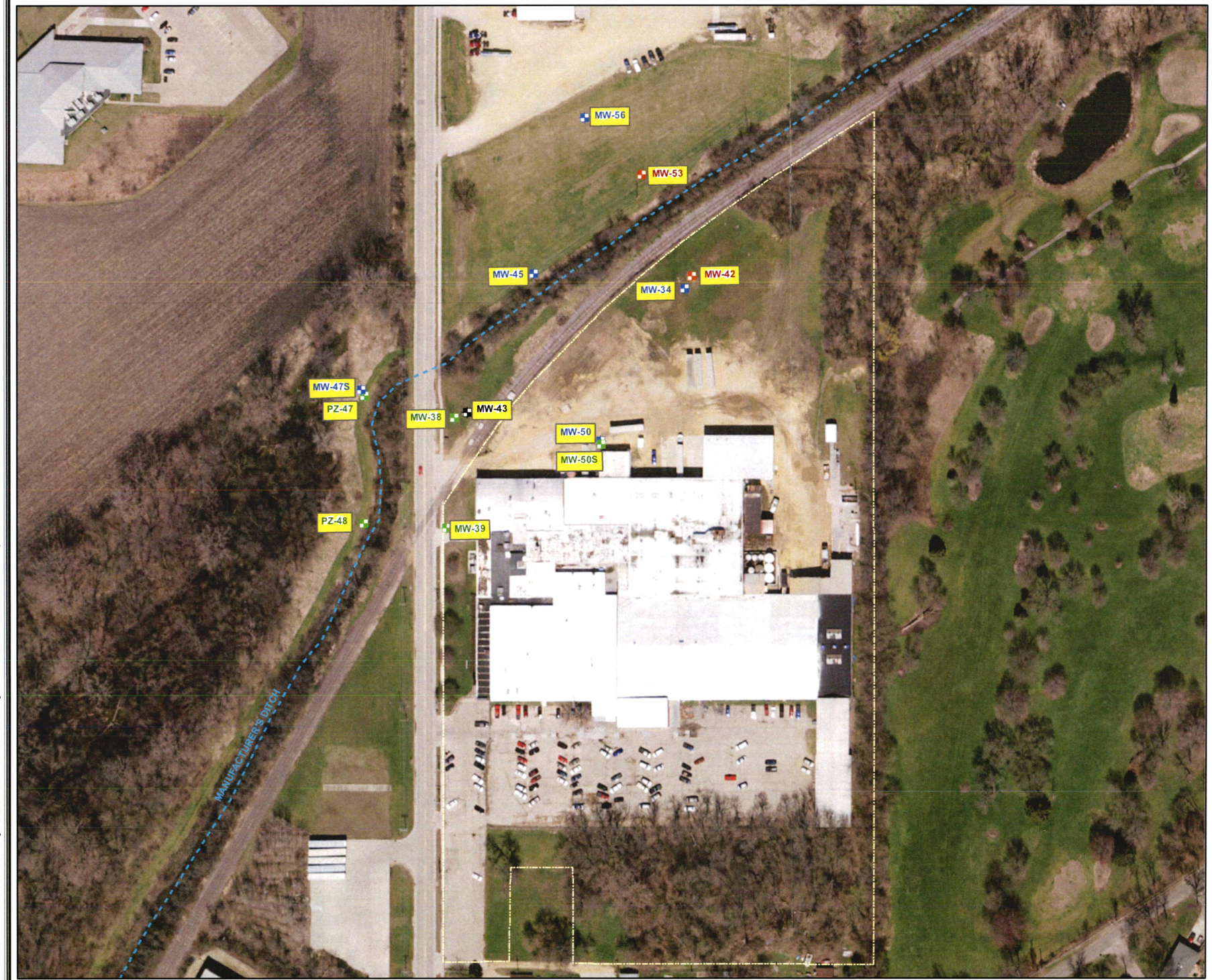


Figure 2

LTM Monitoring Well Locations

Collis, Inc. Manufacturing Facility Clinton, Iowa

Legend:

- Manufacturer's Ditch
- Property Boundary (Approximate)

Monitoring Wells

- First Saturated Unit
- Second Saturated Unit
- Third Saturated Unit
- Fourth Saturated Unit
- LTM Monitoring Well

Note:
LTM = long term monitoring

NORTH

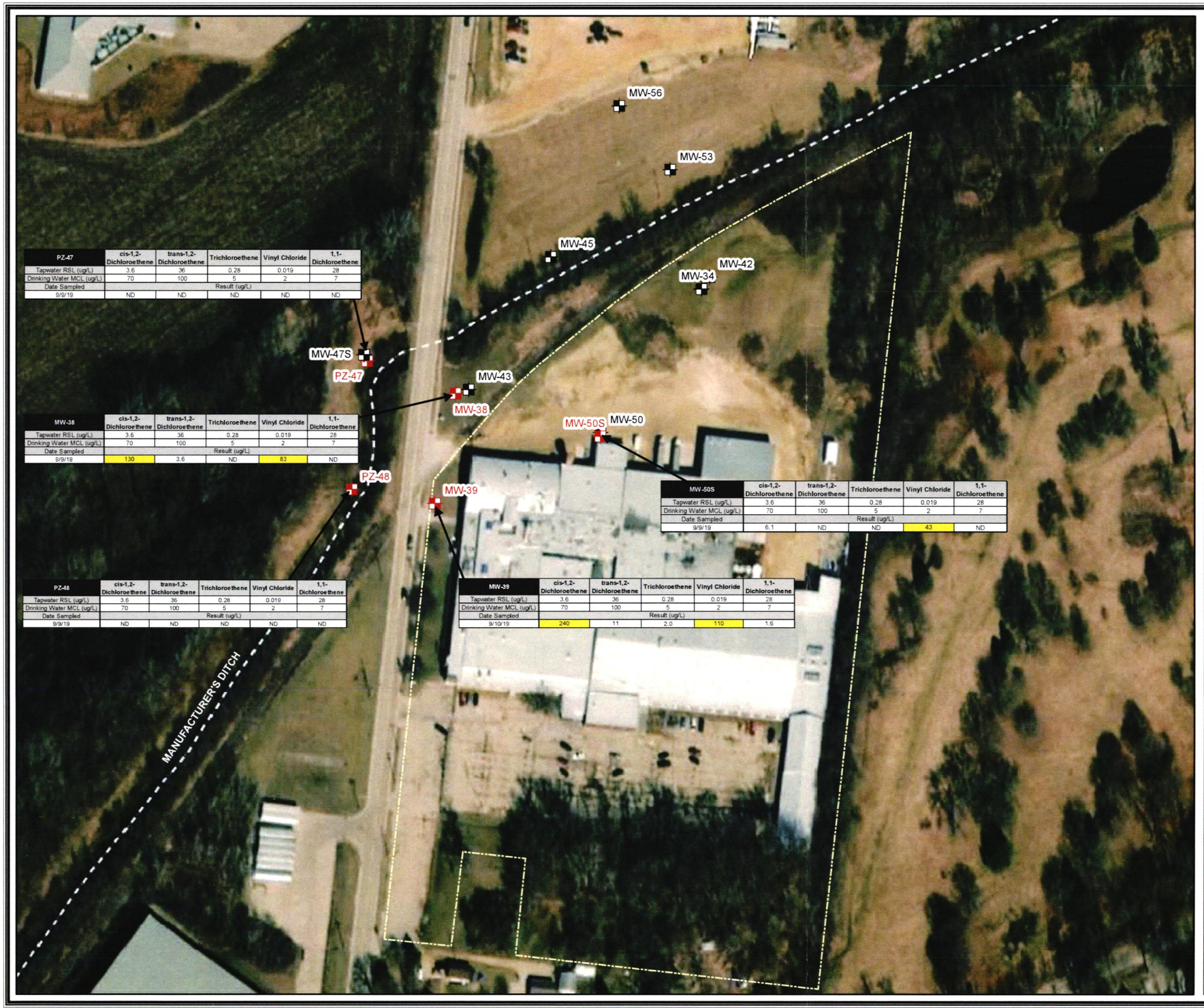
0 250 500

Feet

BB&E

Document Path: H:\LTM\GIS\SSWC\Collis\figures\02028025 - 2019 LTM Monitoring\2019 First semi-annual LTM\GIS Files\Figure 2 - Site Features.mxd

Service Layer Credits: State of Iowa 2016 Spring Imagery
KVB 4/17/2019



PZ-47	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl Chloride	1,1-Dichloroethene
Tapwater RSL (ug/L)	3.6	36	0.28	0.019	28
Drinking Water MCL (ug/L)	70	100	5	2	7
Date Sampled	Result (ug/L)				
9/9/19	ND	ND	ND	ND	ND

MW-38	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl Chloride	1,1-Dichloroethene
Tapwater RSL (ug/L)	3.6	36	0.28	0.019	28
Drinking Water MCL (ug/L)	70	100	5	2	7
Date Sampled	Result (ug/L)				
9/9/19	130	3.6	ND	83	ND

MW-50S	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl Chloride	1,1-Dichloroethene
Tapwater RSL (ug/L)	3.6	36	0.28	0.019	28
Drinking Water MCL (ug/L)	70	100	5	2	7
Date Sampled	Result (ug/L)				
9/9/19	6.1	ND	ND	43	ND

PZ-48	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl Chloride	1,1-Dichloroethene
Tapwater RSL (ug/L)	3.6	36	0.28	0.019	28
Drinking Water MCL (ug/L)	70	100	5	2	7
Date Sampled	Result (ug/L)				
9/9/19	ND	ND	ND	ND	ND

MW-39	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl Chloride	1,1-Dichloroethene
Tapwater RSL (ug/L)	3.6	36	0.28	0.019	28
Drinking Water MCL (ug/L)	70	100	5	2	7
Date Sampled	Result (ug/L)				
9/10/19	240	11	2.0	110	1.6

Figure 3

Detections Summary
First Saturated Unit
September 2019

Collis, Inc. Manufacturing Facility
Clinton, Iowa

Legend:

- Wells Sampled Unit 1
- Wells Not Sampled Unit 1
- Manufacturer's Ditch
- Property Boundary (Approximate)

NOTES:

1. Only results from monitoring wells/piezometers sampled during the Corrective Measures Implementation (CMI) Long Term Monitoring (LTM) are included on this figure.
2. Yellow highlighting indicates exceedance of United States Environmental Protection Agency (USEPA) Maximum Contaminant Level (MCL) or USEPA May 2019 Tapwater Regional Screening Level (RSL) Criteria, if no MCL is available.

ND = not detected
µg/L = micrograms per liter

NORTH

0 100 200

Feet

BB&E

Document Path: H:\IT\GIS\SSW\Collis\figures\02028025 - 2019 LTM Monitoring\2019 Second semi-annual LTM\GIS files\Figure 3 - SSW_Collis_Results_1stsatunit_Sept19.mxd

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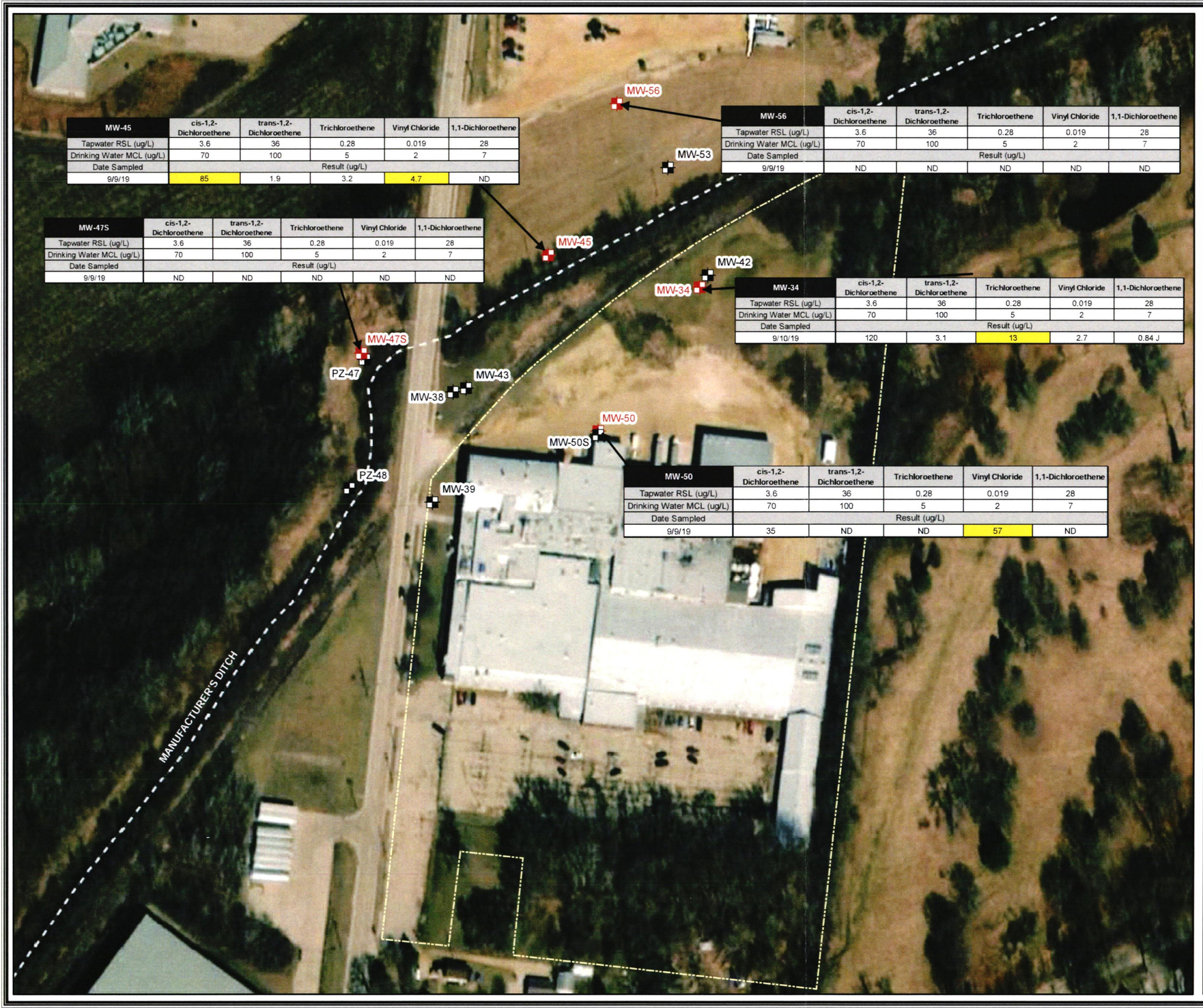
KVB - 9/30/2019



MW-45	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl Chloride	1,1-Dichloroethene
Tapwater RSL (ug/L)	3.6	36	0.28	0.019	28
Drinking Water MCL (ug/L)	70	100	5	2	7
Date Sampled	Result (ug/L)				
9/9/19	85	1.9	3.2	4.7	ND

MW-56	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl Chloride	1,1-Dichloroethene
Tapwater RSL (ug/L)	3.6	36	0.28	0.019	28
Drinking Water MCL (ug/L)	70	100	5	2	7
Date Sampled	Result (ug/L)				
9/9/19	ND	ND	ND	ND	ND

MW-47S	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl Chloride	1,1-Dichloroethene
Tapwater RSL (ug/L)	3.6	36	0.28	0.019	28
Drinking Water MCL (ug/L)	70	100	5	2	7
Date Sampled	Result (ug/L)				
9/9/19	ND	ND	ND	ND	ND

MW-34	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl Chloride	1,1-Dichloroethene
Tapwater RSL (ug/L)	3.6	36	0.28	0.019	28
Drinking Water MCL (ug/L)	70	100	5	2	7
Date Sampled	Result (ug/L)				
9/10/19	120	3.1	13	2.7	0.84 J

MW-50	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl Chloride	1,1-Dichloroethene
Tapwater RSL (ug/L)	3.6	36	0.28	0.019	28
Drinking Water MCL (ug/L)	70	100	5	2	7
Date Sampled	Result (ug/L)				
9/9/19	35	ND	ND	57	ND

Figure 4

Detections Summary
Second Saturated Unit
September 2019

Collis, Inc. Manufacturing Facility
Clinton, Iowa

Legend:

- Location Sampled
- Location Not Sampled
- Manufacturer's Ditch
- Property Boundary (Approximate)

NOTES:

1. Only results from monitoring wells sampled during the Corrective Measures Implementation (CMI) Long Term Monitoring (LTM) are included on this figure.
2. Yellow highlighting indicates exceedance of May 2019 United States Environmental Protection Agency (USEPA) Maximum Contaminant Level (MCL) or USEPA Tapwater Regional Screening Level (RSL) Criteria, if no MCL is available.

ND = not detected
µg/L = micrograms per liter

NORTH

0 100 200

Feet

BB&E

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

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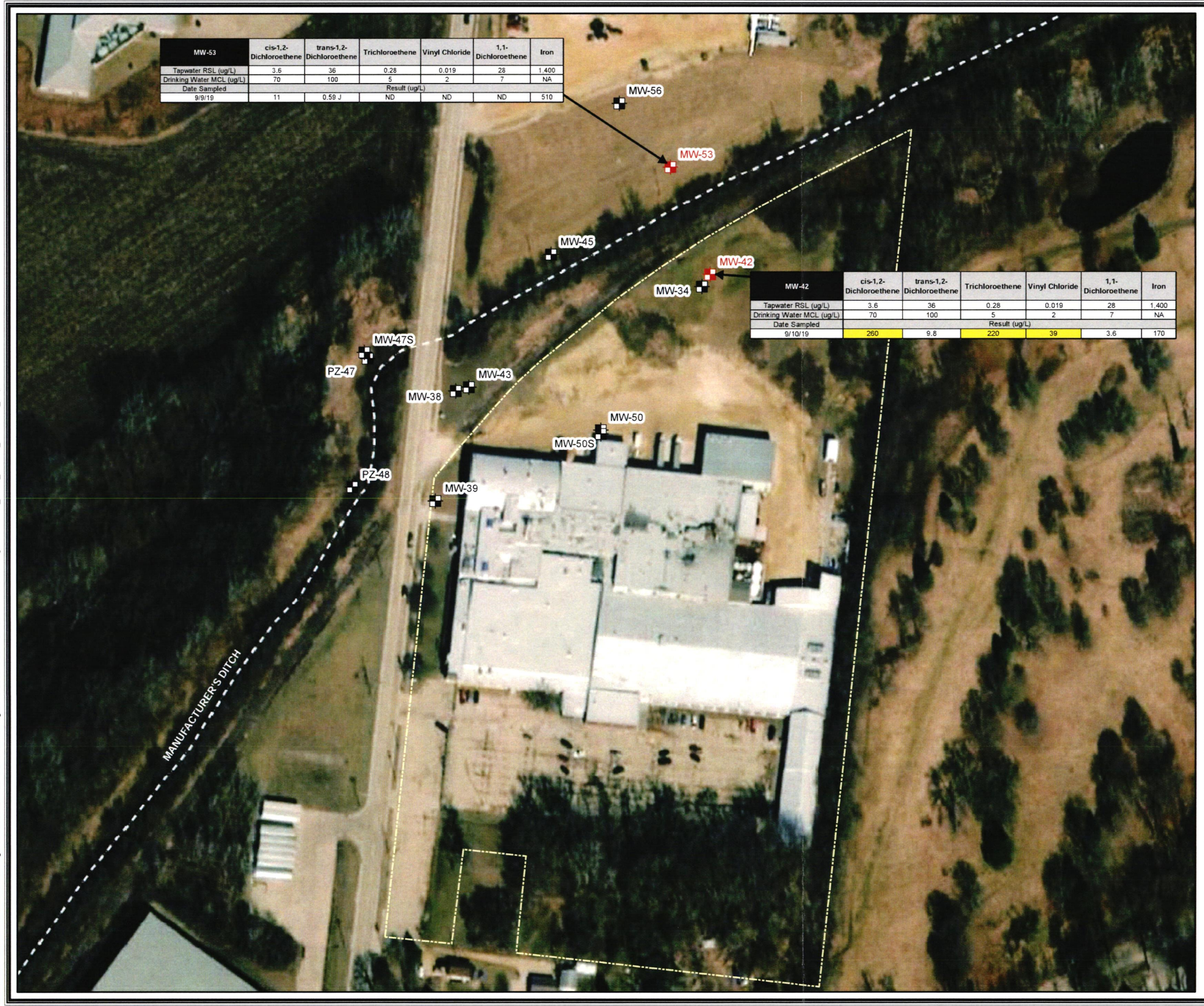

Figure 5

Detections Summary
Third Saturated Unit
September 2019

Collis, Inc. Manufacturing Facility
Clinton, Iowa

Legend:

- Location Sampled
- Location Not Sampled
- Manufacturer's Ditch
- Property Boundary (Approximate)

NOTES:

1. Only results from monitoring wells sampled during the Corrective Measures Implementation (CMI) Long Term Monitoring (LTM) are included on this figure.
2. Yellow highlighting indicates exceedance of the May 2019 United States Environmental Protection Agency (USEPA) Maximum Contaminant Level (MCL) or USEPA Tapwater Regional Screening Level (RSL) Criteria, if no MCL is available.

J = the reported value is an estimate
NA = not available
ND = not detected
µg/L = micrograms per liter

NORTH

0 100 200

Feet

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MW-43	cis-1,2-Dichloroethene	Trichloroethene	Vinyl Chloride
Tapwater RSL (ug/L)	3.6	0.28	0.019
Drinking Water MCL (ug/L)	70	5	2
Date Sampled	Result (ug/L)		
9/9/19	2.2	ND	ND

Figure 6

Detections Summary
Fourth Saturated Unit
September 2019

Collis, Inc. Manufacturing Facility
Clinton, Iowa

Legend:

- Location Sampled
- Location Not Sampled
- Manufacturer's Ditch
- Property Boundary (Approximate)

NOTES:

1. Only results from monitoring wells sampled during the Corrective Measures Implementation (CMI) Long Term Monitoring (LTM) are included on this figure.
2. Yellow highlighting indicates exceedance of the May 2019 United States Environmental Protection Agency (USEPA) Maximum Contaminant Level (MCL) or USEPA Tapwater Regional Screening Level (RSL) Criteria, if no MCL is available.

ND = not detected
µg/L = micrograms per liter

NORTH

0 100 200

Feet

BB&E

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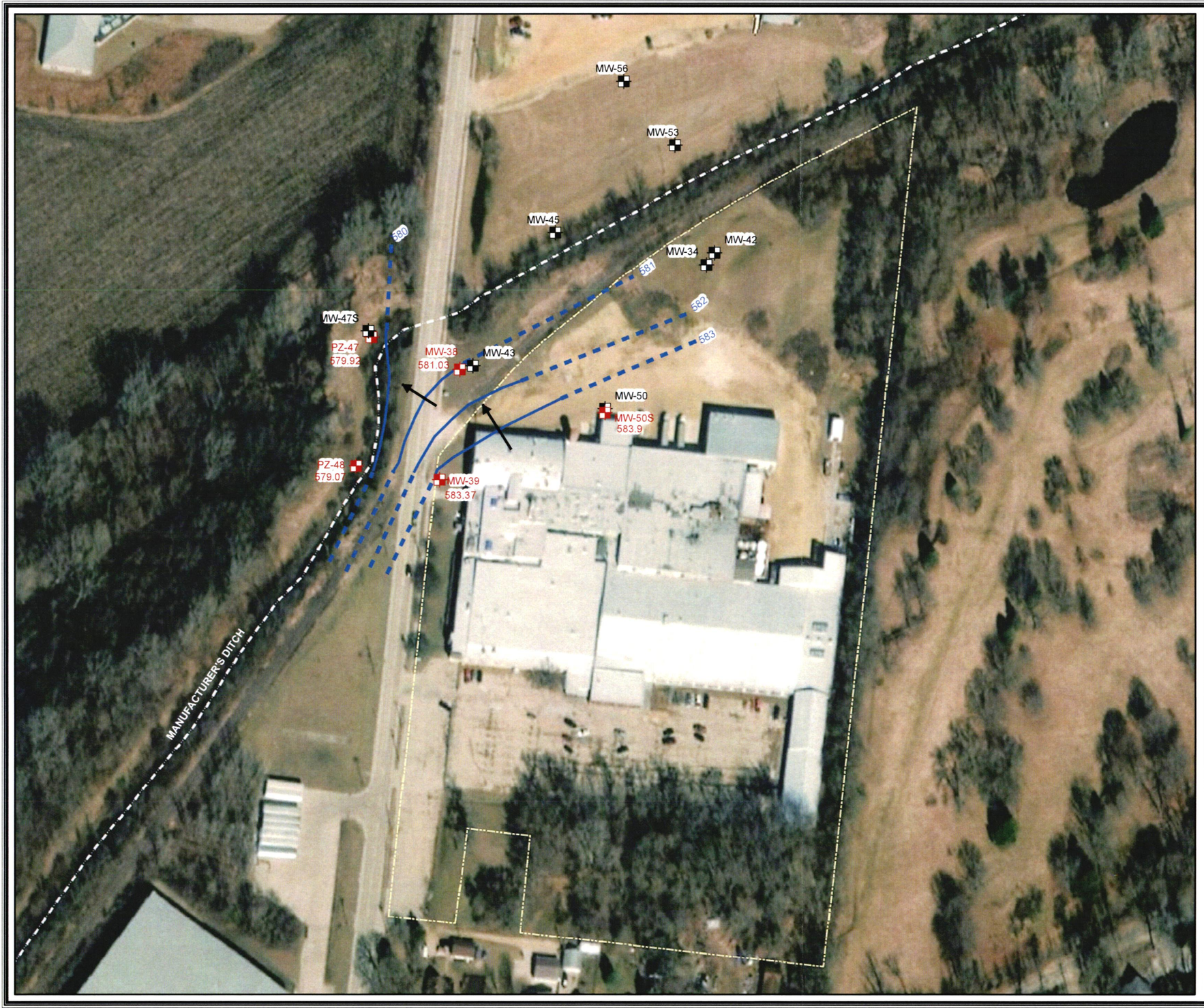

Figure 7

Potentiometric Surface Map
First Saturated Unit
September 2019

Collis, Inc. Manufacturing Facility
Clinton, Iowa

Legend:

- Monitoring Well/Piezometer Location (Elevations included)
- Monitoring Well/Piezometer Location (Elevations excluded)
- Water Table Elevation (dashed where inferred)
- Groundwater Flow Direction
- Manufacturer's Ditch
- Property Boundary (Approximate)

NOTES:

1. Monitoring wells shaded in black were excluded from use in generating this potentiometric surface map due to belonging to a different hydrological unit.

2. Monitoring wells MW-42 and MW-53 are located in the third saturated unit and MW-43 belongs to the deep bedrock hydrological unit. A separate figure was not created for these hydrological units as data from two wells is inadequate for accurate creation of groundwater contours.

3. Due to limitations of software interpolation, this drawing is intended to be used as an overview of the general groundwater flow conditions at the site. Groundwater contours may not pass through the included monitoring wells due to the display of groundwater contours at a constant interval. Contour placement represents an interpolation between two or more monitoring wells with known water levels, observed at the time of sampling; therefore, contours are inferred.

4. Groundwater contours developed using ArcGIS Desktop 10.6 Spatial Analyst Extension.

NORTH

0 100 200

Feet

BB&E

Document Path: H:\IT\GIS\SSW\Collis\figures\02028025 - 2019 LTM Monitoring\2019 Second semi-annual LTM\GIS files\Figure 7 - SSW_Collis_GWContours_1stsatunit_April19.mxd

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KVB - 9/17/2019

Figure 8

Potentiometric Surface Map
Second Saturated Unit
September 2019

Collis, Inc. Manufacturing Facility
Clinton, Iowa

Legend:

- Monitoring Well/Piezometer Location (Elevations included)
- Monitoring Well/Piezometer Location (Elevations excluded)
- Potentiometric Surface (dashed where inferred)
- Groundwater Flow Direction
- Manufacturer's Ditch
- Property Boundary (Approximate)

NOTES:

1. Monitoring wells shaded in black were excluded from use in generating this potentiometric surface map either due to belonging to a different hydrological unit, or due to artesian flow conditions. Wells with artesian flow conditions in the second saturated unit are identified as MW-45

2. Monitoring wells MW-42 and MW-53 are located in the third saturated unit and MW-43 belongs to the deep bedrock hydrological unit. A separate figure was not created for these hydrological units as data from two wells is inadequate for accurate creation of groundwater contours.

3. Due to limitations of software interpolation, this drawing is intended to be used as an overview of the general groundwater flow conditions at the site. Groundwater contours may not pass through the included monitoring wells due to the display of groundwater contours at a constant interval. Contour placement represents an interpolation between two or more monitoring wells with known water levels, observed at the time of sampling; therefore, contours are inferred.

4. Groundwater contours developed using ArcGIS Desktop 10.6 Spatial Analyst Extension.

NORTH

0 100 200

Feet

BB&E

Document Path: H:\IT\GIS\SSW\Collis\figures\02028025 - 2019 LTM Monitoring\2019 Second semi-annual LTM\GIS files\Figure 8 - SSW_Collis_GWContours_2ndupperunit_Sept19.mxd

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KVB -9/18/2019

TABLES

TABLE 1
GROUNDWATER DATA SUMMARY
SSW COLLIS
CLINTON, IA

First Saturated Groundwater Unit										
MONITORING WELL	PARAMETERS (mg/L)	cis-1,2-DCE	trans-1,2-DCE	TCE	Vinyl Chloride	1,1-DCE	Lead	1,4-Dioxane	Methane	Ethane
	CAS #	156-59-2	156-60-5	79-01-6	75-01-4	75-35-4	7439-92-1	123-91-1	74-82-8	74-84-0
	EPA MAY 2019 RSL TAPWATER SCREENING CRITERIA (mg/L)	0.0036	0.036	0.00028	0.000019	0.028	0.015	0.00046	NA	NA
	EPA DRINKING WATER MCL (mg/L)	0.07	0.100	0.005	0.002	0.007	0.015	NA	NA	NA
MW-38	10/15/14	0.110	0.0070	ND	0.093	ND	NS	NS	NS	NS
	3/19/15	0.10	0.0052	ND	0.074	ND	NS	NS	NS	NS
	5/13/15	0.110	0.0053	ND	0.088	ND	NS	NS	NS	NS
	9/18/15	0.100	0.0055	ND	0.069	ND	NS	NS	NS	NS
	9/29/16	0.099	0.0054	ND	0.084	ND	NS	NS	NS	NS
	12/15/16	0.088	0.0032	ND	0.028	ND	NS	NS	NS	NS
	2/28/17	0.087	0.0032	ND	0.084	ND	NS	NS	NS	NS
	5/4/17	0.12	0.0077	ND	0.081	ND	NS	NS	NS	NS
	6/19/18	0.12	0.0052	ND	0.082	ND	NS	NS	NS	NS
	10/1/18	0.13	0.0056	ND	0.097	ND	NS	NS	NS	NS
	4/8/19	0.10	0.0032	ND	0.055	ND	NS	NS	NS	NS
	9/9/19	0.13	0.0036	ND	0.083	ND	NS	NS	NS	NS
MW-39	10/14/14	0.38	0.024	ND	0.16	0.0026	NS	NS	NS	NS
	3/19/15	0.3	0.017	ND	0.096	0.0018	NS	NS	NS	NS
	5/13/15	0.33	0.016	ND	0.11	0.0018	NS	NS	NS	NS
	9/18/15	0.25	0.016	ND	0.086	0.0019	NS	NS	NS	NS
	9/29/16	0.19	0.015	ND	0.082	0.0016	NS	NS	NS	NS
	12/15/16[1]	NS	NS	NS	NS	NS	NS	NS	NS	NS
	3/2/17	0.26	0.011	ND	0.065	0.0012	NS	NS	NS	NS
	5/4/17	0.27	0.016	ND	0.093	0.0019	NS	NS	NS	NS
	6/19/18	0.29	0.016	ND	0.085	0.0019	NS	NS	NS	NS
	6/19/18 DUP	0.26	0.016	ND	0.074	0.0021	NS	NS	NS	NS
	10/2/18	0.21	0.011	ND	0.058	0.0012	NS	NS	NS	NS
	4/9/19	0.21	0.0088	ND	0.075	0.001	NS	NS	NS	NS
	9/10/19	0.23	0.0110	ND	0.11	0.0015	NS	NS	NS	NS
	9/10/2019 DUP	0.24	0.0110	0.002	0.1	0.0016	NS	NS	NS	NS
MW-50S	10/13/14	ND	ND	ND	0.0068	ND	NS	NS	NS	NS
	3/18/15	0.0056	ND	ND	0.046	ND	NS	NS	NS	NS
	5/13/15	0.0079	ND	ND	0.072	ND	NS	NS	NS	NS
	9/17/15	0.0086	ND	ND	0.075	ND	NS	NS	NS	NS
	9/29/16	0.0068	ND	ND	0.042	ND	NS	NS	NS	NS
	12/15/16	0.0098	ND	ND	0.043	ND	NS	NS	NS	NS
	3/1/17	0.0084	ND	ND	0.025	ND	NS	NS	NS	NS
	3/1/17 DUP	0.0088	ND	ND	0.027	ND	NS	NS	NS	NS
	5/4/17	0.015	ND	ND	0.052	ND	NS	NS	NS	NS
	6/20/18	0.0081	ND	ND	0.045	ND	NS	NS	NS	NS
	10/2/18	0.0058	ND	ND	0.030	ND	NS	NS	NS	NS
	4/9/19	0.0077	ND	ND	0.037	ND	NS	NS	NS	NS
	9/9/19	0.0061	ND	ND	0.043	ND	NS	NS	NS	NS
PZ-47	3/12/12	NS	NS	NS	NS	NS	3.9	NS	NS	NS
	6/12/12	NS	NS	NS	NS	NS	1.1	NS	NS	NS
	10/13/14[2]	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/16/15	NS	NS	NS	NS	NS	0.098	NS	NS	NS
	9/28/16	ND	ND	ND	ND	ND	NS	NS	NS	NS
	12/13/16	ND	ND	ND	ND	ND	NS	NS	NS	NS
	3/2/17	ND	ND	ND	ND	ND	NS	NS	NS	NS
	5/2/17	ND	ND	ND	ND	ND	NS	NS	NS	NS
	6/18/18	ND	ND	ND	ND	ND	NS	NS	NS	NS
	10/1/18	ND	ND	ND	ND	ND	NS	NS	NS	NS
	10/1/18 DUP	ND	ND	ND	ND	ND	NS	NS	NS	NS
	4/8/19	ND	ND	ND	ND	ND	NS	NS	NS	NS
	9/9/19	ND	ND	ND	ND	ND	NS	NS	NS	NS
PZ-48	9/28/16	ND	ND	ND	ND	ND	NS	NS	NS	NS
	12/13/16	ND	ND	ND	ND	ND	NS	NS	NS	NS
	3/2/17	ND	ND	ND	ND	ND	NS	NS	NS	NS
	5/2/17	ND	ND	ND	ND	ND	NS	NS	NS	NS
	6/18/18	ND	ND	ND	ND	ND	NS	NS	NS	NS
	10/1/18	ND	ND	ND	ND	ND	NS	NS	NS	NS
	4/8/19	ND	ND	ND	ND	ND	NS	NS	NS	NS
	9/9/19	ND	ND	ND	ND	ND	NS	NS	NS	NS

Notes:
Exceeds EPA Region VI Drinking Water MCLs or May 2019 (most current) Tapwater RSLs (Target Risk=1E-06, Hazard Quotient=0.1), if no MCL exists.
[1] Not sampled due to inclement weather.
[2] PZ-47 was damaged and could not be sampled.
Only compounds that were detected in one or more samples are shown in the table.
March, May, and September 2015. Phase III was conducted September and December 2016, February/March and May 2017. The 2018 first-semiannual LTM event was conducted June 2018 and the second semi-annual LTM event was conducted October 2018. The 2019 first semi-annual LTM event was conducted April and the second semi-annual LTM was conducted in September.
mg/L = milligrams per liter
CAS - unique numerical identifier assigned by Chemical Abstracts Service (CAS)
DCE - Dichloroethene
EPA - United States Environmental Protection Agency
MCL - Maximum Contaminant Level
MW - Monitoring Well
RSL - Regional Screening Level
NA - Not Available
ND - Non-Detect
NS - Not Sampled
PZ - Piezometer
TCE- Trichloroethene

TABLE 1
GROUNDWATER DATA SUMMARY
COLLIS, INC.
CLINTON, IA

Second Saturated Groundwater Unit															
	PARAMETERS (mg/L)	cis-1,2-DCE	trans-1,2-DCE	TCE	Vinyl Chloride	1,1-DCE	1,4-Dioxane	Methane	Ethane	Ethene	Iron	Manganese	Chloride	Sulfate	Nitrogen, Nitrate-Nitrite
	CAS #	156-59-2	156-60-5	79-01-6	75-01-4	75-35-4	123-91-1	74-82-8	74-84-0	74-85-1	7439-89-6	7439-96-5	10043-52-4	18785-72-3	NA
	EPA MAY 2019 RSL TAPWATER SCREENING CRITERIA (mg/L)	0.0036	0.036	0.00028	0.000019	0.028	0.00046	NA	NA	NA	1.40	NA	NA	NA	NA
MONITORING WELL	EPA DRINKING WATER MCL (mg/L)	0.07	0.100	0.00500	0.0020	0.007	NA	NA	NA	NA	NA	NA	NA	NA	10
MW-34	3/16/12	0.091	0.0033	0.0170	ND	ND	NS	0.13	0.011	NS	NS	NS	NS	NS	NS
	6/13/12	0.1	0.0037	0.0270	0.00690	ND	NS	NS	0.0024	NS	NS	NS	NS	NS	NS
	9/26/2012	0.039	0.0018	0.0200	ND	ND	NS	0.24	0.013	NS	NS	NS	NS	NS	NS
	11/30/12	0.033	0.0013	0.0160	ND	ND	NS	ND	ND	NS	NS	NS	NS	NS	NS
	10/17/14	0.084	0.0031	0.0230	0.00950	ND	ND	0.19	0.012	ND	0.14	0.33	72	69	0.028
	3/19/15	0.09	0.0029	0.0210	0.00670	ND	ND	0.15	0.011	ND	ND	0.27	68	78	0.12
	5/13/15	0.089	0.0026	0.0170	0.02000	ND	ND	0.28	0.017	0.00091 J	ND	0.29	78	78	ND
	9/17/15	0.11	0.0035	0.0280	0.00400	ND	0.00071	0.24	0.012	ND	0.02 J	0.44	68	75	0.019 J
	9/29/16	0.1	0.0035	0.0240	0.00460	ND	ND	0.38	0.02	ND	0.051 J	0.51	80	77	ND
	12/15/16	0.12	0.0036	0.0230	0.00230	ND	ND	0.21	0.011	ND	0.03 J	0.35	60	68	0.015 J
	12/15/2016 DUP	0.13	0.0036	0.0240	0.00260	ND	ND	0.22	0.011	ND	0.018 J	0.38	42	68	ND
	3/1/17	0.12	0.0021	0.0170	0.00270	0.00045 J	ND	0.18	0.012	ND	0.0059 J	0.074	77	74	0.033
	5/4/17	0.11	0.0040	0.0140	0.01500	ND	ND	0.32	0.02	ND	0.055 J	0.75	130	100	ND
	5/4/2017 DUP	0.12	0.0040	0.0130	0.01400	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS
	6/19/18	0.1	0.0024	0.0160	0.00240	ND	ND	0.23	0.016	ND	0.033 J	0.69	77	71	ND
	10/1/18	0.086	0.0031	0.0160	0.00150	0.00067 J	ND	0.19	0.017	0.0026 J	0.019 J	0.51	45	68	ND
	4/9/19	0.065	0.0010	0.0096	0.00066 J	ND	ND	0.044	ND	ND	ND	0.12	75	65	0.82
	9/10/19	0.12	0.0031	0.0130	0.00270	0.00084 J	ND	0.17	0.012	ND	ND	0.35	59	55	ND
MW-45	03/16/12	0.019	0.0011	0.00420	ND	ND	NS	ND	ND	NS	NS	NS	NS	NS	NS
	06/13/12	0.015	ND	0.00400	ND	ND	NS	NS	ND	NS	NS	NS	NS	NS	NS
	09/26/12	0.01	ND	0.00350	ND	ND	NS	0.025	ND	NS	NS	NS	NS	NS	NS
	11/30/12	0.01	ND	0.00400	ND	ND	NS	ND	ND	NS	NS	NS	NS	NS	NS
	10/16/14	0.032	0.0013	0.00520	ND	ND	ND	NS	NS	NS	NS	NS	NS	NS	NS
	03/18/15	0.011	ND	0.00360	ND	ND	ND	NS	NS	NS	NS	NS	NS	NS	NS
	05/12/15	0.02	0.00096 J	0.00590	ND	ND	ND	NS	NS	NS	NS	NS	NS	NS	NS
	09/15/15	0.023	ND	0.00460	ND	ND	ND	NS	NS	NS	NS	NS	NS	NS	NS
	09/28/16	0.084	0.0029	0.00530	0.00420	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/28/16 DUP	0.083	0.0028	0.00530	0.00420	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS
	12/14/16	0.031	ND	0.00310	ND	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS
	12/14/16 DUP	0.035	ND	0.00430	ND	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS
	02/28/17	0.019	0.00081 J	0.00480	ND	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS
	05/04/17	0.067	0.00250	0.00620	ND	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS
	06/19/18	0.048	0.0015	0.00420	ND	ND	ND	NS	NS	NS	NS	NS	NS	NS	NS
	10/2/18	0.04	0.0014	0.00400	ND	ND	ND	NS	NS	NS	NS	NS	NS	NS	NS
	4/8/19	0.087	0.0025	0.00400	0.0042	ND	ND	NS	NS	NS	NS	NS	NS	NS	NS
	9/9/19	0.085	0.0019	0.00320	0.0047	ND	ND	NS	NS	NS	NS	NS	NS	NS	NS

Notes:

Exceeds EPA Region VI Drinking Water MCLs or May 2019 (most current) Tapwater RSLs (Target Risk=1E-06, Hazard Quotient=0.1), if no MCL exists.

[1] Not sampled due to inclement weather.

Only compounds that were detected in one or more samples are shown in the table.

Phase I, II, and III detections are also shown on this table. Phase I was conducted in March, June, September, and November 2012. Phase II was conducted October 2014, March, May, and September 2015. Phase III was conducted September and December 2016, February/March and May 2017. The 2018 first-semiannual LTM event was conducted June 2018 and the second semi-annual LTM event was conducted October 2018. The 2019 first semi-annual LTM event was conducted April and the second semi-annual LTM event was conducted in September.

mg/L = milligrams per liter
CAS - unique numerical identifier assigned by Chemical Abstracts Service (CAS)
DCE - Dichloroethene
EPA - United States Environmental Protection Agency
MCL - Maximum Contaminant Level
MW - Monitoring Well
RSL - Regional Screening Level
NA - Not Available
ND - Non-Detect
NS - Not Sampled
PZ - Piezometer
TCE- Trichloroethene

TABLE 1
GROUNDWATER DATA SUMMARY
COLLIS, INC.
CLINTON, IA

Second Saturated Groundwater Unit															
	PARAMETERS (mg/L)	cis-1,2-DCE	trans-1,2-DCE	TCE	Vinyl Chloride	1,1-DCE	1,4-Dioxane	Methane	Ethane	Ethene	Iron	Manganese	Chloride	Sulfate	Nitrogen, Nitrate-Nitrite
	CAS #	156-59-2	156-60-5	79-01-6	75-01-4	75-35-4	123-91-1	74-82-8	74-84-0	74-85-1	7439-89-6	7439-96-5	10043-52-4	18785-72-3	NA
	EPA MAY 2019 RSL TAPWATER SCREENING CRITERIA (mg/L)	0.0036	0.036	0.00028	0.000019	0.028	0.00046	NA	NA	NA	1.40	NA	NA	NA	NA
MONITORING WELL	EPA DRINKING WATER MCL (mg/L)	0.07	0.100	0.00500	0.0020	0.007	NA	NA	NA	NA	NA	NA	NA	NA	10
MW-47S	5/5/10	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS
	3/14/12	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	6/12/12	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	10/14/14	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS
	3/16/15	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS
	5/11/15	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/15/15	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/28/16	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS
	12/15/16[1]	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	2/28/17	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS
	5/2/17	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS
	6/19/18	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS
	10/1/18	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS
	4/8/19	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/9/19	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS
MW-50	5/4/10	0.0468	ND	ND	0.0732	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS
	10/15/14	0.042	ND	ND	0.057	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS
	3/18/15	0.028	ND	ND	0.043	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS
	5/13/15	0.029	ND	ND	0.039	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/17/15	0.018	ND	ND	0.052	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/29/16	0.031	ND	ND	0.045	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS
	12/15/16	0.035	ND	ND	0.056	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS
	3/1/17	0.032	ND	ND	0.039	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS
	5/4/17	0.044	ND	ND	0.065	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS
	6/20/18	0.028	ND	ND	0.043	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS
	10/1/18	0.027	ND	ND	0.040	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS
	4/9/19	0.031	ND	ND	0.040	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/9/19	0.035	ND	ND	0.057	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS
MW-56	10/17/14	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS	NS	NS	NS
	3/17/15	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS	NS	NS	NS
	5/12/15	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS	NS	NS	NS
	9/17/15	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS	NS	NS	NS
	9/29/16	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS
	12/15/16[1]	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	2/28/17	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS
	5/2/17	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS
	6/19/18	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS
	10/2/18	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS
	4/8/19	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS
	4/8/2019 (DUP)	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/9/19	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS

Notes:
Exceeds EPA Region VI Drinking Water MCLs or May 2019 (most current) Tapwater RSLs (Target Risk=1E-06, Hazard Quotient=0.1), if no MCL exists.
[1] Not sampled due to inclement weather.
Only compounds that were detected in one or more samples are shown in the table.

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mg/L = milligrams per liter
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DCE - Dichloroethene
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MW - Monitoring Well
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NA - Not Available
ND - Non-Detect
NS - Not Sampled
PZ - Piezometer
TCE- Trichloroethene

TABLE 1
GROUNDWATER DATA SUMMARY
SSW COLLIS
CLINTON, IA

Third Saturated Groundwater Unit															
	PARAMETERS (mg/L)	cis-1,2-DCE	trans-1,2-DCE	TCE	Vinyl Chloride	1,1-DCE	1,4-Dioxane	Methane	Ethane	Ethene	Iron	Manganese	Chloride	Sulfate	Nitrogen, Nitrate-Nitrite
	CAS #	156-59-2	156-60-5	79-01-6	75-01-4	75-35-4	123-91-1	74-82-8	74-84-0	74-85-1	7439-89-6	7439-96-5	10043-52-4	18785-72-3	NA
	EPA MAY 2019 RSL TAPWATER SCREENING CRITERIA (mg/L)	0.0036	0.036	0.00028	0.000019	0.028	0.00046	NA	NA	NA	1.4	NA	NA	NA	NA
MONITORING WELL	EPA DRINKING WATER MCL (mg/L)	0.0700	100	0.0050	0.002	0.007	NA	NA	NA	NA	NA	NA	NA	NA	10
MW-42	3/16/12	0.190	0.0077	0.240	0.043	0.003	NS	0.22	0.007	NS	NS	NS	NS	NS	NS
	6/14/12	0.220	0.0076	0.290	0.04	0.0034	NS	NS	0.0028	NS	NS	NS	NS	NS	NS
	9/26/12	0.180	0.0074	0.170	0.045	0.0031	NS	ND	ND	NS	NS	NS	NS	NS	NS
	11/29/12	0.180	0.007	0.160	0.043	0.0034	NS	0.25	0.013	NS	NS	NS	NS	NS	NS
	10/16/14	0.181	0.0077	0.260	0.039	0.005	ND	0.30	0.014	ND	0.071	0.32	77	100	ND
	3/20/15	0.180	0.0063	0.160	0.029	0.003	ND	0.19	0.0068	0.00035 J	0.084	0.17	65	100	0.093
	5/13/15	0.230	0.006	0.160	0.026	0.0029	0.0098	0.21	0.0057	0.00045 J	0.093	0.26	60	97	ND
	9/15/15	0.330	0.0078	0.087	0.038	0.0031	0.0011	0.18	0.0054	ND	0.034	0.27	0.059	0.096	ND
	9/27/16	0.360	0.0095	0.240	0.032	0.0035	ND	0.25	0.0068	ND	0.11	0.30	60	110	ND
	12/13/16	0.350	0.0088	0.230	0.032	0.0035	ND	0.27	0.0077	ND	0.16	0.28	60	110	ND
	3/2/17	0.360	0.0082	0.270	0.027	0.003	ND	0.27	0.0068	ND	0.24	0.30	60	100	ND
	5/4/17	0.340	0.011	0.300	0.031	0.0034	ND	0.18	0.0041	0.00072 J	0.13	0.32	61	98	ND
	6/19/18	0.250	0.0078	0.180	0.037	0.0025	ND	0.260	0.012	0.0051	0.12	0.34	75	100	ND
	6/19/18 DUP	0.240	0.0092	0.190	0.032	0.0029	ND	0.240	0.011	0.0037 J	0.12	0.3	73	100	ND
	10/1/18	0.320	0.011	0.260	0.027	0.0035	ND	0.190	0.0091	0.0015 J	0.049 J	0.28	57	110	ND
	10/1/18 DUP	0.260	0.010	0.240	0.028	0.0036	ND	0.190	0.0097	0.0019 J	0.055 J	0.33	50	110	ND
	4/9/2019	0.280	0.016	0.250	0.047	0.0026	ND	0.310	ND	ND	0.1	0.29	68	100	ND
	4/9/2019 DUP	0.280	0.010	0.290	0.049	0.0026	ND	0.280	ND	ND	0.078 J	0.3	72	110	ND
	9/10/2019	0.260	0.0098	0.220	0.039	0.0036	ND	0.240	0.01	ND	0.17	0.31	67	99	ND
MW-53	3/16/12	0.0240	0.0012	ND	ND	ND	NS	0.03	ND	NS	NS	NS	NS	NS	NS
	6/13/12	0.0180	ND	ND	0.0016	ND	NS	NS	ND	NS	NS	NS	NS	NS	NS
	9/26/12	0.0160	ND	ND	ND	ND	NS	ND	ND	NS	NS	NS	NS	NS	NS
	11/29/12	0.0031	ND	ND	ND	ND	NS	ND	ND	NS	NS	NS	NS	NS	NS
	10/13/14	0.0043	ND	ND	ND	ND	NS	0.026	ND	ND	0.24	0.18	30	56	ND
	3/17/15	0.0170	ND	ND	0.0016	ND	NS	0.025	ND	ND	0.024 J	0.049	25	44	ND
	5/12/15	0.0150	0.00075 J	ND	0.0014	ND	NS	0.023	ND	ND	0.46	0.048	24	40	ND
	9/16/15	0.0190	ND	ND	0.0014	ND	NS	0.03	ND	ND	0.11	0.048	23	44	0.011 J
	9/29/16	0.0170	ND	ND	ND	ND	ND	0.031	ND	ND	0.49	0.450	60	41	ND
	12/14/16	0.0067	ND	ND	ND	ND	ND	0.01	ND	ND	0.43	0.042	25	42	ND
	2/28/17	0.0064	0.00035 J	ND	0.00056 J	ND	ND	0.018	ND	ND	1.4	0.043	22	41	ND
	2/28/17 DUP	0.0070	0.00036 J	ND	0.00070 J	ND	ND	0.014	ND	ND	0.98	0.040	21	41	ND
	5/4/17	0.0074	ND	ND	ND	ND	ND	0.011	ND	ND	0.62	0.049	24	40	ND
	5/4/17 DUP	0.0076	ND	ND	ND	ND	ND	0.0098	ND	ND	0.52	0.048	23	39	ND
	6/19/18	0.0095	ND	ND	0.00085 J	ND	ND	0.013	ND	ND	0.32	0.049	22	37	ND
	10/2/18	0.0120	0.00067 J	ND	0.0012	ND	ND	0.019	0.0017 J	0.00071 J	0.096	0.049	30	35	ND
	4/8/19	0.0120	0.00059 J	ND	0.0012	ND	ND	0.021	ND	ND	0.18	0.045	23	35	ND
	9/9/19	0.0110	0.00056 J	ND	ND	ND	ND	0.012	ND	ND	0.27	0.048	18	35	ND
	9/9/2019 (DUP)	0.0110	0.00059 J	ND	ND	ND	ND	0.014	ND	ND	0.51	0.047	18	34	ND

Notes:

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PZ - Piezometer
TCE- Trichloroethene

TABLE 1
GROUNDWATER DATA SUMMARY
SSW COLLIS
CLINTON, IA

Fourth Saturated Groundwater Unit				
MONITORING WELL	PARAMETERS (mg/L)	cis-1,2-DCE	TCE	Vinyl Chloride
	CAS #	156-59-2	79-01-6	75-01-4
	EPA MAY 2019 RSL TAPWATER SCREENING CRITERIA (mg/L)	0.0036	0.00028	0.000019
	EPA DRINKING WATER MCL (mg/L)	0.0700	0.005	0.002
MW-43	10/15/14	0.0068	ND	ND
	3/18/15	0.0056	ND	0.0015
	5/12/15	0.0019	ND	0.0019
	9/16/15	0.0013	ND	0.0039
	9/29/16	0.0045	ND	0.0022
	12/15/16	ND	ND	ND
	2/28/17	0.00058 J	ND	0.0027
	5/4/17	0.0049	ND	ND
	6/19/18	0.003	ND	0.0024
	10/1/18	0.0028	ND	0.0027
	4/8/19	0.0023	ND	ND
	9/9/19	0.0022	ND	ND

Notes:

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NS - Not Sampled
PZ - Piezometer
TCE- Trichloroethene

TABLE 2
WATER ELEVATION SUMMARY
2019 SECOND-SEMI ANNUAL LTM GROUNDWATER MONITORING
COLLIS, INC., CLINTON IOWA

Well ID	TOC ELEVATION (ft amsl)	Constructed Well Depth (ft bgs)	Nominal Screen Interval (ft bgs)	Time	DTW (from TOC)	Elevation (ft amsl)
Measurement Date:				9/9/19		
MW-34	589.29	31.6	25-30	740	5.34	583.95
MW-38	585.47	9.95	5-10	732	4.44	581.03
MW-39	587.47	13.91	9-14	730	4.10	583.37
MW-42	589.25	50.2	42-47	737	4.80	584.45
MW-43*	585.21	99.38	94.75-99.75	734	0.0	585.21
MW-45*	582.41	25.59	19-24	802	0.0	582.41
MW-47S	583.17	17.93	13-18	745	3.01	580.16
MW-50	587.27	24.77	20-25	757	3.54	583.73
MW-50S	587.51	12.28	7.5-12.5	755	3.61	583.9
MW-53*	582.73	52.24	45-50	805	0.0	582.73
MW-56	582.33	30	25-30	810	2.35	579.98
PZ-47	583.17	10.89	1-11	747	3.25	579.92
PZ-48	584.27	10.65	1-11	750	5.20	579.07

Notes:

* Artesian conditions identified

DTW - Depth to water

TOC - Top of casing

ft bgs - feet below ground surface

ft amsl - feet above mean sea level

Table 3
Groundwater Field Parameter Readings
2019 Second Semi-Annual LTM Groundwater Monitoring
Collis Inc., Clinton, Iowa

Monitoring Well	Collection Date	Temperature (°C)	pH (S.U.)	Specific Conductivity (mS/cm)	DO (mg/L)	Turbidity (NTU)	ORP (mV)
PZ-47	9/28/16	17.61	6.61	0.962	0.38	5.3	-30.6
	12/13/16	7.61	6.65	1.05	6.13	1000	-79.6
	2/28/17*	NA	NA	NA	NA	NA	NA
	5/2/17	10.36	6.53	0.791	2.48	300	35.1
	6/18/2018	19.11	7.11	0.953	9.22	44.7	59.9
	10/1/2018	15.61	7.52	0.926	0.0	46.2	-76.5
	4/8/2019	7.17	6.26	0.644	2.97	7.6	24.8
	9/9/2019	16.16	6.88	0.807	0.42	11.7	-69.9
PZ-48	9/28/16	16.61	6.73	0.902	1.82	75.3	-1.8
	12/13/16	10.78	6.9	0.873	5.48	OOR	-270
	2/28/17	9.67	6.65	0.748	33.1	167	151.8
	5/2/17	11.76	6.77	0.595	4.08	5.45	79.2
	6/18/18	20.55	7.45	0.677	9.8	46.8	53.9
	10/1/18	16.76	7.48	0.631	3.18	44.2	24.2
	4/8/19	5.7	6.49	0.458	4.2	26.6	52
	9/9/19	16.77	7.2	0.566	0.98	37.7	-40.2
MW-34	9/29/16	14.76	7	1.183	0.12	1.75	-46.8
	12/15/16	11.7	7.08	0.999	2.55	1.8	228.6
	3/1/17	11.09	7.04	0.714	0.64	19	-33.2
	5/4/17	12.45	7.49	1.014	0.79	1.67	-11.9
	6/19/18	13.83	7.17	0.975	0.46	1.36	0.7
	10/1/18	15.04	7.84	0.835	0.9	2.4	-21.6
	4/9/19	11.71	6.9	0.875	1.59	1.37	51.6
	9/10/19	16.26	7.11	0.766	0.32	1.4	-65.7
MW-38	9/29/16	20.21	6.84	1.655	0.18	11	-81.4
	12/15/16	11.99	6.88	1.364	3.48	10.2	77
	2/28/17	9.2	6.48	1.092	0.23	10.9	-65.8
	5/4/17	12.08	7.13	1.588	0.99	2.6	-6.2
	6/19/18	15.28	6.91	1.642	0.44	5.17	-29.9
	10/1/18	19.28	7.34	1.857	0.34	26.4	-26.3
	4/8/19	9.11	6.7	1.176	1.7	3.01	21.8
	9/9/19	19.19	6.91	1.117	0.31	2.1	-42.7
MW-39	9/29/16	18.04	6.74	2.774	0.15	6.8	-76.5
	12/15/16	NS	NS	NS	NS	NS	NS
	3/2/17	12.99	6.76	2.035	0.55	18.1	-46.2
	5/4/17	14.36	6.98	2.614	1.18	71.5	-26
	6/19/18	15.26	6.84	2.656	0.58	5.07	-18.2
	10/2/18	16.8	7.38	2.45	0.02	6.5	-37.0
	4/9/19	13.52	6.6	1.965	0.63	0.92	-17.2
	9/10/19	17.7	6.82	2.011	0.23	2.2	-43.6
MW-42	9/27/16	15.06	6.68	1.027	0.17	1.29	-18.3
	12/13/16	9.9	7.13	1.085	1.44	3.3	-43.1
	3/2/17	11.29	7.11	0.784	0.57	1.34	-38.8
	5/4/17	13.66	7.44	1.047	1.26	0.9	-6.9
	6/19/18	14.25	7.16	1.111	0.31	4.49	37.2
	10/1/18	14.56	7.98	0.932	0.9	6.2	29.8
	4/9/19	13.11	7.03	0.883	2.59	1.36	-10.4
	9/10/19	16.05	7.19	0.851	0.39	1.0	-45.2
MW-43	9/29/16	14.99	7.45	0.667	0.13	11.2	-144.9
	12/15/16	11.56	7.65	0.639	0.56	1.0	-189.2
	2/28/17	13.21	7.8	0.478	0.36	4.82	-142.3
	5/4/17	13.1	7.61	0.655	0.79	1.43	-25.9
	6/19/18	17.39	7.6	0.654	0.55	2.71	-142.6
	10/1/18	15.33	8.47	0.549	0.32	4.5	-142.6
	4/8/19	14.57	7.35	0.57	0.7	1.59	-60.3
	9/9/19	17.89	7.76	0.537	0.13	1.0	-126.8
MW-45	9/28/16	13.15	7.16	0.856	3.28	39	196.3
	12/14/16	9.95	7.11	0.863	0.5	18.4	165.2
	2/28/17	12.07	7.17	0.639	0.25	39.2	16.5
	5/4/17	11.75	7.4	0.838	0.71	6.9	9.1
	6/19/18	12.64	7.21	0.831	0.17	4.01	-1.5
	10/2/18	14.22	8.07	0.651	0.02	9.1	58.0
	4/8/19	11.52	6.88	0.671	3.05	10.6	71.9
	9/9/19	12.78	7.18	0.600	0.31	5.1	29.7
MW-47s	9/28/16	12.77	6.97	0.736	1.02	10.6	-100
	12/15/16	NS	NS	NS	NS	NS	NS
	2/28/17	9.91	7.01	0.47	2.11	30.7	-51.1
	5/2/17	9.92	6.87	0.602	1.8	28.1	-62.8
	6/19/18	11.57	7.12	0.679	0.31	14.7	-68.8
	10/1/18	13.85	7.92	0.608	0	0.09	-39.0
	4/8/19	9.19	6.51	0.532	1.76	4.7	-64.2
	9/9/19	14.21	7.06	0.502	0.4	5.7	-96.2
MW-50	9/29/16	15.87	6.95	2.422	0.2	9.19	-102.3
	12/15/16	13.75	6.82	2.529	0.4	1.43	-97.1
	3/1/17	12.55	6.99	1.931	0.48	15	-92.6
	5/4/17	13.54	7.23	2.496	1.18	1.03	-55.6
	6/20/18	13.75	7.04	2.53	0.5	4.62	-0.1
	10/1/18	14.77	7.71	0.1932	0.44	20.2	53.7
	4/9/19	12.59	6.89	1.99	0.99	4.62	-36.1
	9/9/19	15.56	7.04	1.805	0.18	1.3	-57.6

Table 3
Groundwater Field Parameter Readings
2019 Second Semi-Annual LTM Groundwater Monitoring
Collis Inc., Clinton, Iowa

Monitoring Well	Collection Date	Temperature (°C)	pH (S.U.)	Specific Conductivity (mS/cm)	DO (mg/L)	Turbidity (NTU)	ORP (mV)
MW-50S	9/29/16	17.09	7.01	2.065	0.22	39.3	-105.2
	12/15/16	13.34	6.89	2.08	0.5	16.6	-99.8
	3/1/17	10.32	7.12	1.192	0.71	2.79	-29.1
	5/4/15	11.9	7.35	1.8	0.92	5.65	-82.8
	6/20/18	13.65	7.15	1.711	0.27	2.18	-14.3
	10/2/18	15.73	7.66	1.04	0.1	14.2	-8.0
	4/9/19	10.66	6.88	1.307	1.4	4.72	-12.8
	9/9/19	17.11	7.16	1.04	0.25	1.1	-74.4
MW-53	9/29/16	11.78	7.35	0.756	0.27	15.5	-96.1
	12/14/16	9.3	7.35	0.761	0.4	1	-75.5
	2/28/17	11.51	7.29	0.5444	0.29	6.53	-85.8
	5/4/17	11.97	7.55	0.735	0.6	1.2	-40.2
	6/19/18	13.69	7.35	0.724	0.22	1.66	-18.4
	10/2/18	11.1	8.11	0.559	0.07	9	-63.0
	4/8/19	12.19	7.06	0.596	3.71	2.06	-46.7
	9/9/19	12.48	7.36	0.521	0.21	2.1	-59.2
MW-56	9/29/16	13.16	6.95	0.739	1.54	75.3	-94.4
	12/15/16	NS	NS	NS	NS	NS	NS
	2/28/17	11.12	6.97	0.513	0.31	46	-93.5
	5/2/17	11.24	6.81	0.632	1.97	85.9	-101.2
	6/19/18	13.44	7.02	0.691	0.17	2.6	-72.2
	10/2/18	13.61	7.59	0.531	0.35	1.7	-73.0
	4/8/19	9.89	6.67	0.512	10.01	16.7	-36.0
	9/9/19	13.29	6.98	0.514	0.21	3.0	-106.7

Notes:
* PZ-47 dried up before field parameters could be collected.
Phase III groundwater field parameters are included in the table. Phase III was conducted during Q3 and Q4 of 2016 and Q1 and Q2 of 2017
The 2018 first semi-annual (SA) long term monitoring (LTM) event was conducted in June 2018, the 2018 second SA LTM event was conducted in October 2018, and the 2019 first SA LTM event was conducted in April 2019.
Only wells included in the LTM are shown in the table
°C - Degrees Celsius
mg/L - milligram per liter
mS/cm - milliSiemens per centimeter
mV - millivolt
NM - Not Measured
NS - not sampled
NTU - Nephelometric Turbidity Unit
ORP - Oxidation Reduction Potential
S.U. - pH Standard Units
OOR - Out of Range on the turbidity meter (1000+NTU)

TABLE 4
VAPOR INTRUSION SCREENING
COLLIS, INC.
CLINTON, IA

	PARAMETERS (ug/L)	cis-1,2-DCE	trans-1,2-DCE	TCE	Vinyl Chloride	1,1-DCE
	CAS #	156-59-2	156-60-5	79-01-6	75-01-4	75-35-4
	VISL Target Groundwater Concentration (µg/L) TCR:10^{-6} THQ:0.1	NA	NA	1.9**	2.45	82.1
	VISL Target Groundwater Concentration (µg/L) TCR:10^{-5} THQ:1	NA	NA	19**	24.5	821
Monitoring Well	**Sample Date**	**First Saturated Groundwater Unit**				
MW-38	9/29/16	99	5.4	ND	84	ND
	12/15/16	88	3.2	ND	28	ND
	2/28/17	87	3.2	ND	84	ND
	5/4/17	120	7.7	ND	81	ND
	6/19/18	120	5.2	ND	82	ND
	10/1/18	130	5.6	ND	97	ND
	4/8/19	100	3.2	ND	55	ND
	9/9/19	130	3.6	ND	83	ND
MW-39	9/29/16	190	15	ND	82	1.6
	12/15/2016*	NS	NS	NS	NS	NS
	3/2/17	260	11	ND	65	1.2
	5/4/17	270	16	ND	93	1.9
	6/19/18	290	16	ND	85	1.9
	6/19/18 DUP	260	16	ND	74	2.1
	10/2/18	210	11	ND	58	1.2
	4/9/19	210	8.8	ND	75	1.0
	9/10/19	230	11	ND	110	1.5
	9/10/2019 DUP	240	11	2	100	1.6
MW-50S	9/29/16	6.8	ND	ND	42	ND
	12/15/16	9.8	ND	ND	43	ND
	3/1/17	8.4	ND	ND	25	ND
	3/1/17 DUP	8.8	ND	ND	27	ND
	5/4/17	15	ND	ND	52	ND
	6/20/18	8.1	ND	ND	45	ND
	10/2/18	5.8	ND	ND	30	ND
	4/9/19	7.7	ND	ND	37	ND
	9/9/19	6.1	ND	ND	43	ND
PZ-47	9/28/16	ND	ND	ND	ND	ND
	12/13/16	ND	ND	ND	ND	ND
	3/2/17	ND	ND	ND	ND	ND
	5/2/17	ND	ND	ND	ND	ND
	6/18/18	ND	ND	ND	ND	ND
	10/1/18	ND	ND	ND	ND	ND
	10/1/18 DUP	ND	ND	ND	ND	ND
	4/8/19	ND	ND	ND	ND	ND
	9/9/19	ND	ND	ND	ND	ND
PZ-48	9/28/16	ND	ND	ND	ND	ND
	12/13/16	ND	ND	ND	ND	ND
	3/2/17	ND	ND	ND	ND	ND
	5/2/17	ND	ND	ND	ND	ND
	6/18/18	ND	ND	ND	ND	ND
	10/1/18	ND	ND	ND	ND	ND
	4/8/19	ND	ND	ND	ND	ND
	9/9/19	ND	ND	ND	ND	ND

Notes:

Exceeds VISL (Target Cancer Risk = 1E-06, Target Hazard Quotient = 0.1)

Exceeds VISL (Target Cancer Risk = 1E-05, Target Hazard Quotient = 1)

Phase III results are also included in the table. Phase III was conducted September and December 2016, February/March and May 2017. The 2018 first semi-annual LTM event was conducted June 2018. The 2018 second semi-annual LTM event was conducted October 2018. The 2019 first semi-annual LTM event was conducted April 2019 and the second semi-annual event was conducted in September 2019.

* MW-39, MW-47S and MW-56 were not sampled during Q4 2016 (Phase III) due to inclement weather.

** TCE target groundwater concentrations for vapor intrusion screening were back calculated from the EPA Region 7 action levels for TCE in air: 6 ug/m3 for an eight-hour commercial/industrial work shift per EPA instructions provided in their letter comments to BB&E dated January 26, 2017.

VISL Target Groundwater Concentrations were calculated using the EPA Vapor Intrusion Screening Level Calculator for commercial exposure, updated May 2018.

VISL comparisons were not included for the Third and Fourth Saturated Units.

Only compounds that were detected in one or more samples are shown in the table.

µg/L - micrograms per liter

CAS - unique numerical identifier assigned by Chemical Abstracts Service (CAS)

DCE - Dichloroethene

J- analyte is present at an estimated concentration between the MDL and Reporting Limit (RL)

LTM - Long Term Monitoring

MDL - Method Detection Limit

MW - Monitoring Well

NA - Not Available

ND - Non-Detect

NS - Not Sampled

PZ - Piezometer

TCE- Trichloroethene

TCR - target cancer risk

THQ - target hazard quotient

VISL - vapor intrusion screening level

TABLE 4
VAPOR INTRUSION SCREENING
COLLIS, INC.
CLINTON, IA

	PARAMETERS (ug/L)	cis-1,2-DCE	trans-1,2-DCE	TCE	Vinyl Chloride	1,1-DCE
	CAS #	156-59-2	156-60-5	79-01-6	75-01-4	75-35-4
	VISL Target Groundwater Concentration (µg/L) TCR:10^{-6} THQ:0.1	NA	NA	1.9**	2.45	82.1
	VISL Target Groundwater Concentration (µg/L) TCR:10^{-5} THQ:1	NA	NA	19**	24.5	821
Monitoring Well	**Sample Date**	**Second Saturated Groundwater Unit**				
MW-34	9/29/16	100	3.5	24	4.6	ND
	12/15/16	120	3.6	23	2.3	ND
	12/15/2016 DUP	130	3.6	24	2.6	ND
	3/1/17	120	2.1	17	2.7	0.45 J
	5/4/17	120	4.0	14	15	ND
	6/19/18	100	2.4	16	2.4	ND
	10/1/18	86	3.1	16	1.5	0.67 J
	4/9/19	65	1	9.6	0.66 J	ND
	9/10/19	120	3.1	13	2.7	0.84 J
MW-45	9/28/16	84	9	5.3	4.2	ND
	12/14/16	31	ND	3.1	ND	ND
	12/14/2016 Dup	35	ND	4.3	ND	ND
	2/28/17	19	0.81 J	4.8	ND	ND
	5/4/17	67	2.5	6.2	ND	ND
	6/19/18	48	1.5	4.2	ND	ND
	10/2/18	40	1.4	4.0	ND	ND
	4/8/19	87	2.5	4.0	4.2	ND
	9/9/19	85	1.9	3.2	4.7	ND
MW-47S	9/28/16	ND	ND	ND	ND	ND
	12/15/16*	NS	NS	NS	NS	NS
	2/28/17	ND	ND	ND	ND	ND
	5/2/17	ND	ND	ND	ND	ND
	6/19/18	ND	ND	ND	ND	ND
	10/1/18	ND	ND	ND	ND	ND
	4/8/19	ND	ND	ND	ND	ND
	9/9/19	ND	ND	ND	ND	ND
MW-50	9/29/16	31	ND	ND	45	ND
	12/15/16	35	ND	ND	56	ND
	3/1/17	32	ND	ND	39	ND
	5/4/17	44	ND	ND	65	ND
	6/19/18	28	ND	ND	43	ND
	10/1/18	27	ND	ND	40	ND
	4/9/19	31	ND	ND	40	ND
	9/9/19	35	ND	ND	57	ND
MW-56	9/29/16	ND	ND	ND	ND	ND
	12/15/2016*	NS	NS	NS	NS	NS
	2/28/17	ND	ND	ND	ND	ND
	5/2/17	ND	ND	ND	ND	ND
	6/19/18	ND	ND	ND	ND	ND
	10/2/18	ND	ND	ND	ND	ND
	4/8/19	ND	ND	ND	ND	ND
	4/8/19 DUP	ND	ND	ND	ND	ND
	9/9/19	ND	ND	ND	ND	ND

Notes:

Exceeds VISL (Target Cancer Risk = 1E-06, Target Hazard Quotient = 0.1)

Exceeds VISL (Target Cancer Risk = 1E-05, Target Hazard Quotient = 1)

Phase III results are also included in the table. Phase III was conducted September and December 2016, February/March and May 2017. The 2018 first semi-annual LTM event was conducted June 2018. The 2018 second semi-annual LTM event was conducted October 2018. The 2019 first semi-annual LTM event was conducted April 2019 and the second semi-annual event was conducted in September 2019.

* MW-39, MW-47S and MW-56 were not sampled during Q4 2016 (Phase III) due to inclement weather.

** TCE target groundwater concentrations for vapor intrusion screening were back calculated from the EPA Region 7 action levels for TCE in air: 6 ug/m3 for an eight-hour commercial/industrial work shift per EPA instructions provided in their letter comments to BB&E dated January 26, 2017.

VISL Target Groundwater Concentrations were calculated using the EPA Vapor Intrusion Screening Level Calculator for commercial exposure, updated May 2018.

VISL comparisons were not included for the Third and Fourth Saturated Units.

Only compounds that were detected in one or more samples are shown in the table.

µg/L - micrograms per liter

CAS - unique numerical identifier assigned by Chemical Abstracts Service (CAS)

DCE - Dichloroethene

J- analyte is present at an estimated concentration between the MDL and Reporting Limit (RL)

LTM - Long Term Monitoring

MDL - Method Detection Limit

MW - Monitoring Well

NA - Not Available

ND - Non-Detect

NS - Not Sampled

PZ - Piezometer

TCE- Trichloroethene

TCR - target cancer risk

THQ - target hazard quotient

VISL - vapor intrusion screening level

TABLE 5
LTM GROUNDWATER MNA RESULTS
COLLIS, Inc.
CLINTON, IA

	MW-34							
	Phase III Quarterly LTM				Semi-annual LTM			
Favorable Conditions*	**Q3 2016**	**Q4 2016**	**Q1 2017**	**Q2 2017**	**SA 1 2018**	**SA 2 2018**	**SA 1 2019**	**SA 2 2019**
DO (<0.5 mg/L)	0.12	2.55	0.64	0.79	0.46	0.9	1.59	0.32
ORP (<50 mV good; <-100 mV better)	-46.8	228.6	-33.2	-11.9	0.7	-21.7	51.6	-65.7
pH (5-9 S.U.)	7	7.08	7.04	7.49	7.17	7.48	6.9	7.11
Sulfate (<20,000 ug/L)	77,000	68,000	74,000	100,000	71,000	68,000	65,000	55,000
Iron (>1,000 ug/L)	51 J	18	5.9 J	55 J	33 J	19 J	ND	ND
Nitrate/Nitrite (<1,000 ug/L)	ND	ND	33	ND	ND	ND	820	ND
Daughter Product: cis-1,2 DCE (ug/L)	100	130	120	120	100	86	65	120
Daughter Product: trans-1,2 DCE (ug/L)	3.5	3.6	2.1	4	2.4	3.1	1	3.1
Daughter Product: 1,1 DCE (ug/L)	ND	ND	0.45 J	ND	ND	0.67 J	ND	0.84 J
Daughter Product: vinyl chloride (ug/L)	4.6	2.6	2.7	15	2.4	1.5	0.66 J	2.7
Dissolved Gases: ethene (ug/L)	ND	ND	ND	ND	ND	2.6 J	ND	ND
Dissolved Gases: ethane (ug/L)	20	11	12	20	16	17	ND	12
Dissolved Gases: methane (>500 ug/L)	380	220	180	320	230	190	44	170

Notes:
*Reference: Wiedemeier, et al., 1998, Evaluating Natural Attenuation of Chlorinated Solvents in Groundwater.

MNA groundwater results shown are from Phase III LTM conducted quarterly 2016-2017; the 2018 first semi-annual LTM conducted June 2018; the 2018 second semi-annual LTM conducted October 2018; the 2019 first semi-annual LTM conducted April 2019 and the 2019 second semi-annual LTM conducted September 2019.

1,1 DCE = 1,1 dichloroethylene
cis-1,2 DCE = cis-1,2-dichloroethylene
DO = Dissolved Oxygen
J = analyte is present at an estimated concentration between the Method Detection Limit and Reporting Limit

LTM = Long Term Monitoring
MNA = Monitored Natural Attenuation
mg/L = milligrams per liter
mV = millivolt
ND = non-detect
NS = not sampled
SA = Semi-annual
S.U.= standard units
trans-1,2 DCE = trans-1,2-dichloroethylene
ug/L = micrograms per liter
Red = does not meet favorable conditions
Green = meets favorable conditions

TABLE 5
LTM GROUNDWATER MNA RESULTS
COLLIS, Inc.
CLINTON, IA

	MW-42							
	Phase III Quarterly LTM				Semi-annual LTM			
Favorable Conditions*	**Q3 2016**	**Q4 2016**	**Q1 2017**	**Q2 2017**	**SA 1 2018**	**SA 2 2018**	**SA 1 2019**	**SA 2 2019**
DO (<0.5 mg/L)	0.17	1.44	0.57	1.26	0.31	0.9	2.59	0.39
ORP (<50 mV good; <-100 mV better)	-18.3	-43.1	-38.8	-6.9	37.2	29.8	-10.4	-45.2
pH (5-9 S.U.)	6.68	7.13	7.11	7.44	7.16	7.98	7.03	7.19
Sulfate (<20,000 ug/L)	110,000	110,000	100,000	98,000	100,000	110,000	110,000	99,000
Iron (>1,000 ug/L)	300	160	240	130	120	55 J	100	170
Nitrate/Nitrite (<1,000 ug/L)	ND	ND	ND	ND	ND	ND	ND	ND
Daughter Product: cis-1,2 DCE (ug/L)	360	350	360	340	250	320	280	260
Daughter Product: trans-1,2 DCE (ug/L)	9.5	8.8	8.2	11	9.2	11	16	9.8
Daughter Product: 1,1 DCE (ug/L)	3.5	3.5	3	3.4	2.9	3.6	2.6	3.6
Daughter Product: vinyl chloride (ug/L)	32	32	27	31	37	28	49	39
Dissolved Gases: ethene (ug/L)	ND	ND	ND	0.72 J	5.1 J	1.9 J	ND	ND
Dissolved Gases: ethane (ug/L)	6.8	7.7	6.8	4.1	12	9.7	ND	10
Dissolved Gases: methane (>500 ug/L)	250	270	270	180	260	190	310	240

Notes:
*Reference: Wiedemeier, et al., 1998, Evaluating Natural Attenuation of Chlorinated Solvents in Groundwater.

MNA groundwater results shown are from Phase III LTM conducted quarterly 2016-2017; the 2018 first semi-annual LTM conducted June 2018; the 2018 second semi-annual LTM conducted October 2018; the 2019 first semi-annual LTM conducted April 2019 and the 2019 second semi-annual LTM conducted September 2019.

1,1 DCE = 1,1 dichloroethylene
cis-1,2 DCE = cis-1,2-dichloroethylene
DO = Dissolved Oxygen
J = analyte is present at an estimated concentration between the Method Detection Limit and Reporting Limit

LTM = Long Term Monitoring
MNA = Monitored Natural Attenuation
mg/L = milligrams per liter
mV = millivolt
ND = non-detect
NS = not sampled
SA = Semi-annual
S.U.= standard units
trans-1,2 DCE = trans-1,2-dichloroethylene
ug/L = micrograms per liter
Red = does not meet favorable conditions
Green = meets favorable conditions

TABLE 5
LTM GROUNDWATER MNA RESULTS
COLLIS, Inc.
CLINTON, IA

	MW-53							
	Phase III Quarterly LTM				Semi-annual LTM			
Favorable Conditions*	**Q3 2016**	**Q4 2016**	**Q1 2017**	**Q2 2017**	**SA 1 2018**	**SA 2 2018**	**SA 1 2019**	**SA 2 2019**
DO (<0.5 mg/L)	0.27	0.4	0.29	0.6	0.22	0.07	3.71	0.21
ORP (<50 mV good; <-100 mV better)	-96.1	-75.5	-85.8	-40.2	-18.4	-73	-46.1	-59.2
pH (5-9 S.U.)	7.35	7.35	7.29	7.55	7.35	8.11	7.06	7.36
Sulfate (<20,000 ug/L)	41,000	42,000	41,000	40,000	37,000	35,000	35,000	35,000
Iron (>1,000 ug/L)	490	430	1,400	620	320	96	180	510
Nitrate/Nitrite (<1,000 ug/L)	ND	ND	ND	ND	ND	ND	ND	ND
Daughter Product: cis-1,2 DCE (ug/L)	17	6.7	7	7.6	9.5	12	12	11
Daughter Product: trans-1,2 DCE (ug/L)	ND	ND	0.36 J	ND	ND	0.67 J	0.59 J	0.59 J
Daughter Product: 1,1 DCE (ug/L)	ND	ND	ND	ND	ND	ND	ND	ND
Daughter Product: vinyl chloride (ug/L)	ND	ND	0.7 J	ND	0.85 J	1.2	1.2	ND
Dissolved Gases: ethene (ug/L)	ND	ND	ND	ND	ND	0.71 J	ND	ND
Dissolved Gases: ethane (ug/L)	ND	ND	ND	ND	ND	1.7 J	ND	ND
Dissolved Gases: methane (>500 ug/L)	31	10	18	11	13	19	21	14

Notes:
*Reference: Wiedemeier, et al., 1998, Evaluating Natural Attenuation of Chlorinated Solvents in Groundwater.

MNA groundwater results shown are from Phase III LTM conducted quarterly 2016-2017; the 2018 first semi-annual LTM conducted June 2018; the 2018 second semi-annual LTM conducted October 2018; the 2019 first semi-annual LTM conducted April 2019 and the 2019 second semi-annual LTM conducted September 2019.

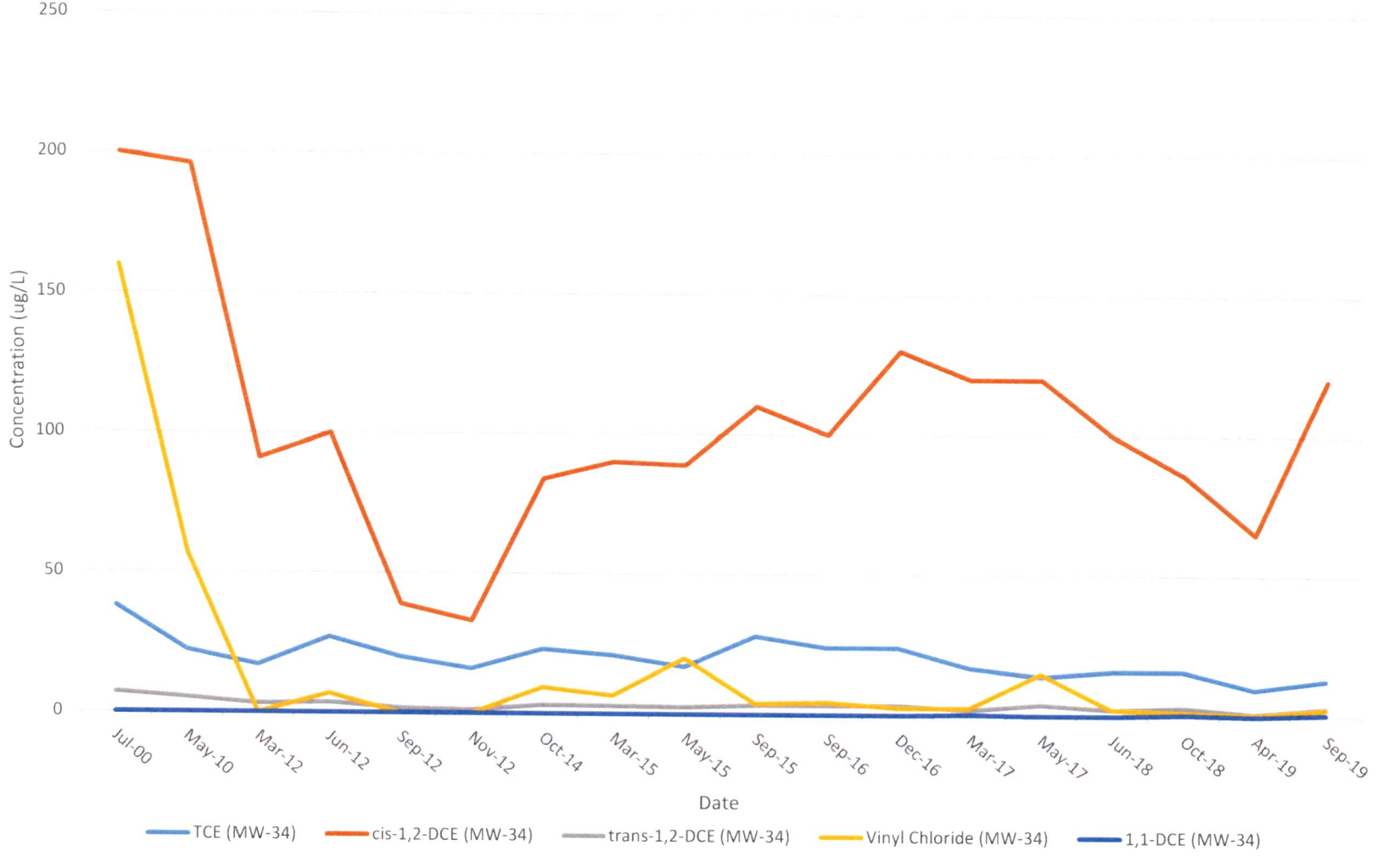
1,1 DCE = 1,1 dichloroethylene
cis-1,2 DCE = cis-1,2-dichloroethylene
DO = Dissolved Oxygen
J = analyte is present at an estimated concentration between the Method Detection Limit and Reporting Limit

LTM = Long Term Monitoring
MNA = Monitored Natural Attenuation
mg/L = milligrams per liter
mV = millivolt
ND = non-detect
NS = not sampled
SA = Semi-annual
S.U.= standard units
trans-1,2 DCE = trans-1,2-dichloroethylene
ug/L = micrograms per liter
Red = does not meet favorable conditions
Green = meets favorable conditions

GRAPHS

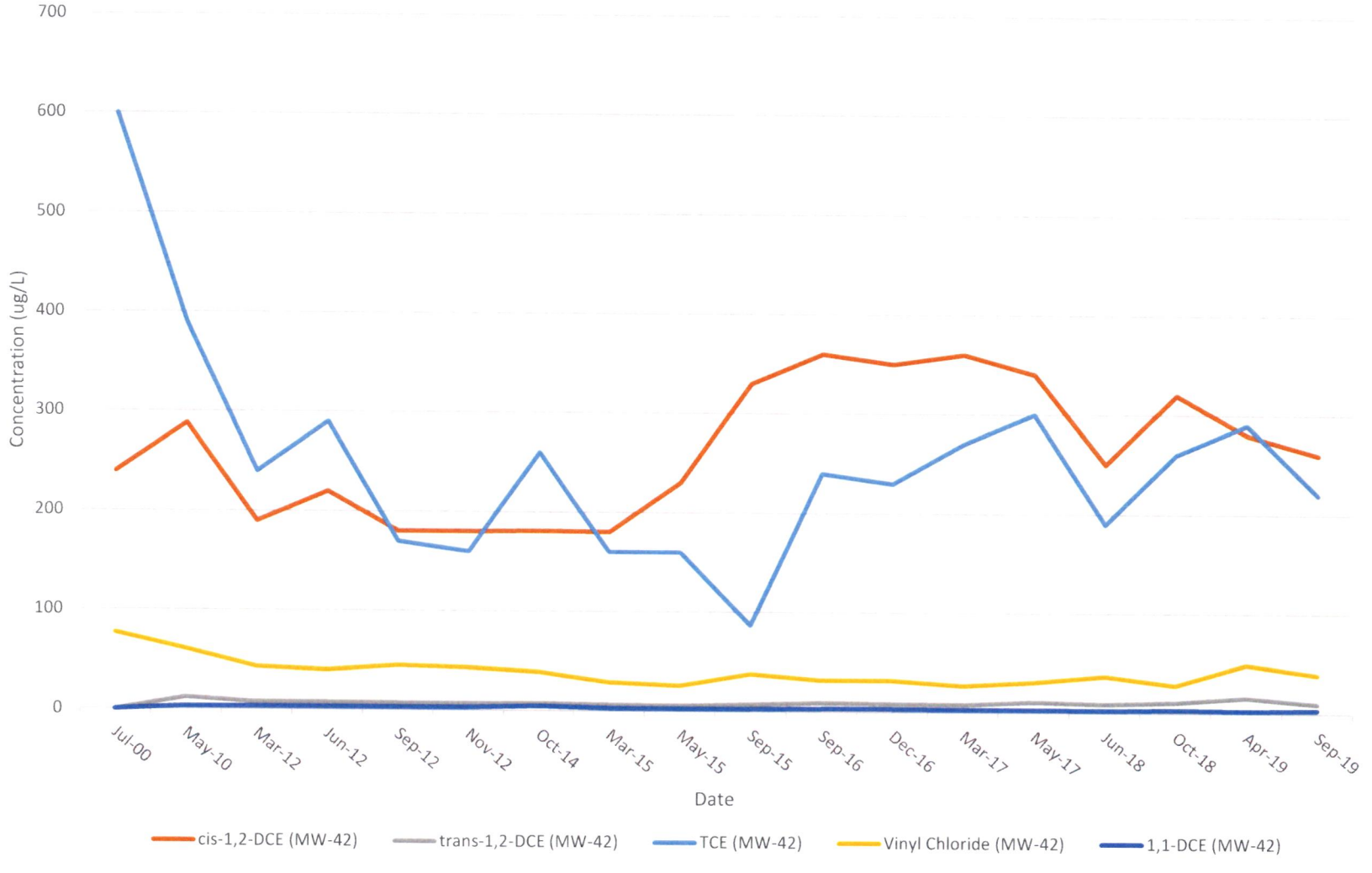
Graph 1

MW-34 Groundwater Concentration Trends



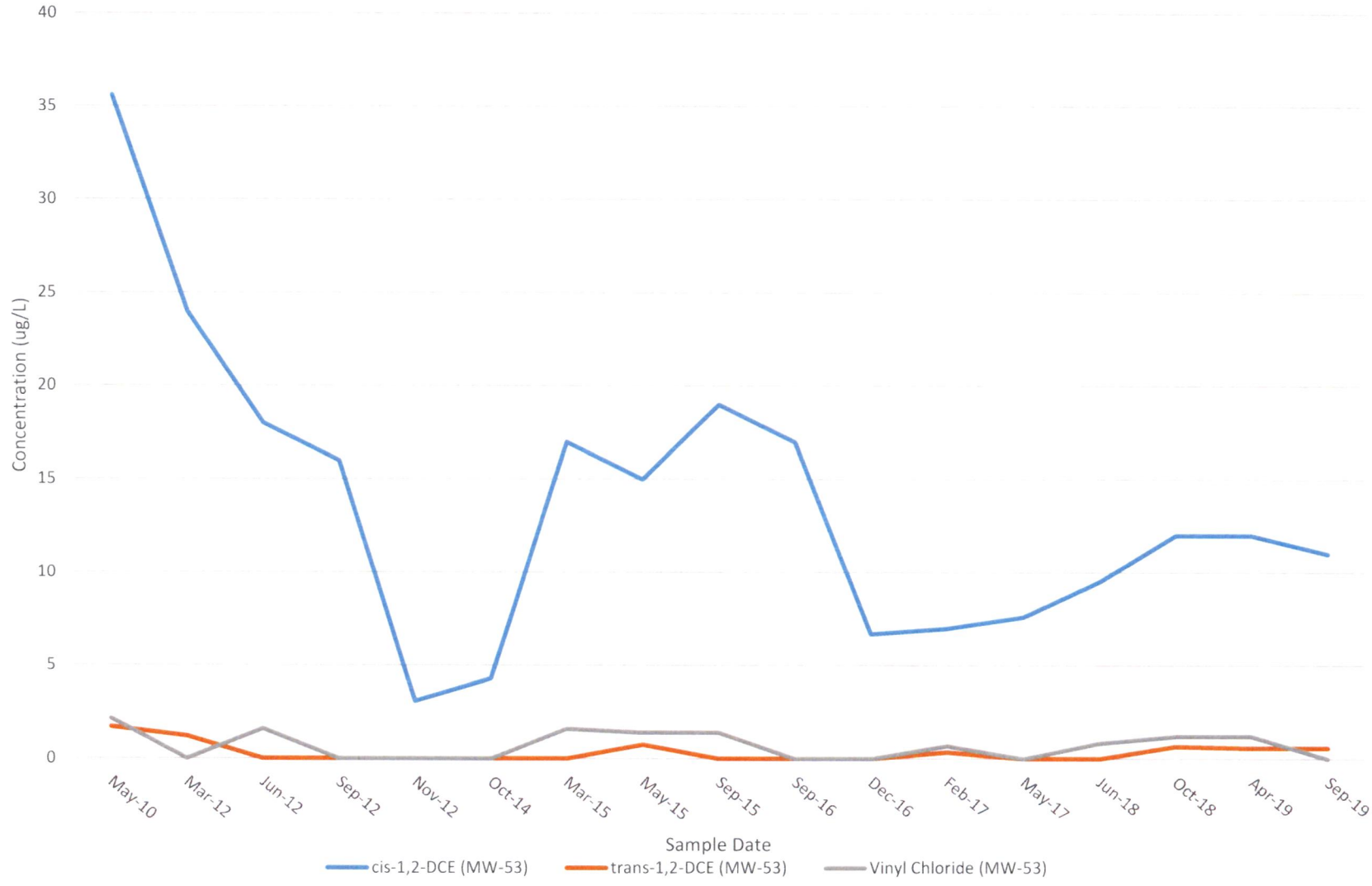
Graph 2

MW-42 Groundwater Concentration Trends



Graph 3

MW-53 Groundwater Concentration Trends



ATTACHMENT A

LABORATORY ANALYTICAL DATA

25-Sep-2019

Kacie Van Buskirk
BB&E, Inc.
235 East Main Street
Suite 107
Northville, MI 48167

Re: **SSW Collis 2019 LTM Task 3** Work Order: **19090657**

Dear Kacie,

ALS Environmental received 16 samples on 11-Sep-2019 09:30 AM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental - Holland and for only the analyses requested.

Sample results are compliant with industry accepted practices and Quality Control results achieved laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 90.

If you have any questions regarding this report, please feel free to contact me:

ADDRESS: 3352 128th Avenue, Holland, MI, USA
PHONE: +1 (616) 399-6070 FAX: +1 (616) 399-6185

Sincerely,

Electronically approved by: Chad Whelton

Chad Whelton
Project Manager

Report of Laboratory Analysis

Certificate No: MN 026-999-449

ALS Group, USA

Date: 25-Sep-19

Client: BB&E, Inc.
Project: SSW Collis 2019 LTM Task 3
Work Order: **19090657**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
19090657-01	COL-GW-01	Groundwater		9/9/2019 09:50	9/11/2019 09:30	☐
19090657-02	COL-GW-02	Groundwater		9/9/2019 10:20	9/11/2019 09:30	☐
19090657-03	COL-GW-03	Groundwater		9/9/2019 10:50	9/11/2019 09:30	☐
19090657-04	COL-GW-04	Groundwater		9/9/2019 11:50	9/11/2019 09:30	☐
19090657-05	COL-GW-05	Groundwater		9/9/2019 12:30	9/11/2019 09:30	☐
19090657-06	COL-GW-06	Groundwater		9/9/2019 12:30	9/11/2019 09:30	☐
19090657-07	COL-GW-07	Groundwater		9/9/2019 13:50	9/11/2019 09:30	☐
19090657-08	COL-GW-08	Groundwater		9/9/2019 14:30	9/11/2019 09:30	☐
19090657-09	COL-GW-09	Groundwater		9/9/2019 14:55	9/11/2019 09:30	☐
19090657-10	COL-GW-10	Groundwater		9/9/2019 16:00	9/11/2019 09:30	☐
19090657-11	COL-GW-11	Groundwater		9/9/2019 16:30	9/11/2019 09:30	☐
19090657-12	COL-GW-12	Groundwater		9/10/2019 08:15	9/11/2019 09:30	☐
19090657-13	COL-GW-13	Groundwater		9/10/2019 09:00	9/11/2019 09:30	☐
19090657-14	COL-GW-14	Groundwater		9/10/2019 09:45	9/11/2019 09:30	☐
19090657-15	COL-GW-15	Groundwater		9/10/2019 09:45	9/11/2019 09:30	☐
19090657-16	Trip Blank	Water		9/9/2019	9/11/2019 09:30	☐

ALS Group, USA *Date: 25-Sep-19*

Client:	BB&E, Inc.
Project:	SSW Collis 2019 LTM Task 3
Work Order:	19090657

Case Narrative

Samples for the above noted Work Order were received on 09/11/2019. The attached "Sample Receipt Checklist" documents the status of custody seals, container integrity, preservation, and temperature compliance.

Samples were analyzed according to the analytical methodology previously transmitted in the "Work Order Acknowledgement". Methodologies are also documented in the "Analytical Result" section for each sample. Quality control results are listed in the "QC Report" section. Sample association for the reported quality control is located at the end of each batch summary. If applicable, results are appropriately qualified in the Analytical Result and QC Report sections. The "Qualifiers" section documents the various qualifiers, units, and acronyms utilized in reporting. A copy of the laboratory's scope of accreditation is available upon request.

With the following exceptions, all sample analyses achieved analytical criteria.

Volatile Organics:

Batch R270981A, Method VOC_8260_W, Sample 19090657-12A: Verification of sample preservation indicated a pH >2 despite collection in HCl preserved containers.

Batch R270981A, Method VOC_8260_W, Sample 19090657-12A MS/MSD: The MS/MSD recovery was above the upper control limit for Dichlorodifluoromethane. The corresponding result in the parent sample was non-detect, therefore no qualification is required.

Batch R271001B, Method VOC_8260_W, Sample 19090657-14A MS/MSD: The MS/MSD recovery was above the upper control limit for Dichlorodifluoromethane. The corresponding result in the parent sample was non-detect, therefore no qualification is required.

Batch R271001B, Method VOC_8260_W, Sample 19090657-14A MSD: The MSD recoveries were outside of the lower limits for multiple compounds per the QC report. However, the MS recoveries and the RPDs between the MS and MSD were within control limits. No qualification is required.

Batch R271003, Method VOC_8260_W, Sample VLCSW2-190919: The LCS recovery was above the upper control limit for Dichlorodifluoromethane. The sample results for this batch may be biased high for this analyte.

Batch R271003, Method VOC_8260_W, Sample 19090657-05A MS: The MS recovery was above the upper control limit for Dichlorodifluoromethane. The corresponding result in the

parent sample was non-detect, therefore no qualification is required.

Batch R271003, Method VOC_8260_W, Sample 19090657-05A MSD: The RPD between the MS and MSD was outside the control limit for Iodomethane. The corresponding result in the parent sample should be considered estimated for this analyte.

Extractable Organics:

Batch R271192, Method GASES_RSK175_W, Sample 19090657-05E MSD: The MSD recovery was outside of the control limit for Methane. However, the MS recovery and the RPD between the MS and MSD was in control. No qualification is required.

Metals:
No other deviations or anomalies were noted.

Wet Chemistry:
No other deviations or anomalies were noted.

ALS Group, USA

Date: 25-Sep-19

Client: BB&E, Inc.
Project: SSW Collis 2019 LTM Task 3
WorkOrder: 19090657

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
**	Estimated Value
a	Analyte is non-accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
Hr	BOD/CBOD - Sample was reset outside Hold Time, value should be considered estimated.
J	Analyte is present at an estimated concentration between the MDL and Report Limit
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL
X	Analyte was detected in the Method Blank between the MDL and Reporting Limit, sample results may exhibit background or reagent contamination at the observed level.

Acronym	Description
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
LOD	Limit of Detection (see MDL)
LOQ	Limit of Quantitation (see PQL)
MBLK	Method Blank
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
TDL	Target Detection Limit
TNTC	Too Numerous To Count
A	APHA Standard Methods
D	ASTM
E	EPA
SW	SW-846 Update III

Units Reported	Description
µg/L	Micrograms per Liter
mg/L	Milligrams per Liter

ALS Group, USA

Date: *25-Sep-19*

Client: BB&E, Inc.
Project: SSW Collis 2019 LTM Task 3
Sample ID: COL-GW-01
Collection Date: 9/9/2019 09:50 AM

Work Order: 19090657
Lab ID: 19090657-01
Matrix: GROUNDWATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
VOLATILE ORGANIC COMPOUNDS		Method: **SW8260C**					Analyst: **MF**
1,1,1,2-Tetrachloroethane	U		0.38	1.0	µg/L	1	9/20/2019 06:36
1,1,1-Trichloroethane	U		0.46	1.0	µg/L	1	9/20/2019 06:36
1,1,2,2-Tetrachloroethane	U		0.40	1.0	µg/L	1	9/20/2019 06:36
1,1,2-Trichloroethane	U		0.46	1.0	µg/L	1	9/20/2019 06:36
1,1,2-Trichlorotrifluoroethane	U		0.52	1.0	µg/L	1	9/20/2019 06:36
1,1-Dichloroethane	U		0.44	1.0	µg/L	1	9/20/2019 06:36
1,1-Dichloroethene	U		0.40	1.0	µg/L	1	9/20/2019 06:36
1,1-Dichloropropene	U		0.37	1.0	µg/L	1	9/20/2019 06:36
1,2,3-Trichlorobenzene	U		0.42	1.0	µg/L	1	9/20/2019 06:36
1,2,3-Trichloropropane	U		0.40	1.0	µg/L	1	9/20/2019 06:36
1,2,4-Trichlorobenzene	U		0.45	1.0	µg/L	1	9/20/2019 06:36
1,2,4-Trimethylbenzene	U		0.45	1.0	µg/L	1	9/20/2019 06:36
1,2-Dibromo-3-chloropropane	U		0.43	1.0	µg/L	1	9/20/2019 06:36
1,2-Dibromoethane	U		0.41	1.0	µg/L	1	9/20/2019 06:36
1,2-Dichlorobenzene	U		0.32	1.0	µg/L	1	9/20/2019 06:36
1,2-Dichloroethane	U		0.44	1.0	µg/L	1	9/20/2019 06:36
1,2-Dichloropropane	U		0.48	1.0	µg/L	1	9/20/2019 06:36
1,3,5-Trichlorobenzene	U		0.31	1.0	µg/L	1	9/20/2019 06:36
1,3,5-Trimethylbenzene	U		0.65	1.0	µg/L	1	9/20/2019 06:36
1,3-Dichlorobenzene	U		0.33	1.0	µg/L	1	9/20/2019 06:36
1,3-Dichloropropane	U		0.40	1.0	µg/L	1	9/20/2019 06:36
1,4-Dichlorobenzene	U		0.35	1.0	µg/L	1	9/20/2019 06:36
2,2-Dichloropropane	U		0.52	1.0	µg/L	1	9/20/2019 06:36
2-Butanone	**1.4**	J	**0.52**	**5.0**	**µg/L**	1	9/20/2019 06:36
2-Chloroethyl vinyl ether	U		0.82	1.0	µg/L	1	9/20/2019 06:36
2-Chlorotoluene	U		0.36	1.0	µg/L	1	9/20/2019 06:36
2-Hexanone	U		0.59	5.0	µg/L	1	9/20/2019 06:36
2-Methylnaphthalene	U		0.66	5.0	µg/L	1	9/20/2019 06:36
4-Chlorotoluene	U		0.31	1.0	µg/L	1	9/20/2019 06:36
4-Isopropyltoluene	U		0.10	1.0	µg/L	1	9/20/2019 06:36
4-Methyl-2-pentanone	U		0.52	1.0	µg/L	1	9/20/2019 06:36
Acetone	**7.4**	J	**1.1**	**10**	**µg/L**	1	9/20/2019 06:36
Acrolein	U		0.38	1.0	µg/L	1	9/20/2019 06:36
Acrylonitrile	U		0.50	1.0	µg/L	1	9/20/2019 06:36
Benzene	U		0.46	1.0	µg/L	1	9/20/2019 06:36
Benzyl chloride	U		0.34	1.0	µg/L	1	9/20/2019 06:36
Bromobenzene	U		0.38	1.0	µg/L	1	9/20/2019 06:36
Bromochloromethane	U		0.45	1.0	µg/L	1	9/20/2019 06:36

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: BB&E, Inc.
Project: SSW Collis 2019 LTM Task 3
Sample ID: COL-GW-01
Collection Date: 9/9/2019 09:50 AM

Work Order: 19090657
Lab ID: 19090657-01
Matrix: GROUNDWATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Bromodichloromethane	U		0.49	1.0	µg/L	1	9/20/2019 06:36
Bromoform	U		0.56	1.0	µg/L	1	9/20/2019 06:36
Bromomethane	U		0.90	1.0	µg/L	1	9/20/2019 06:36
Carbon disulfide	U		0.49	1.0	µg/L	1	9/20/2019 06:36
Carbon tetrachloride	U		0.40	1.0	µg/L	1	9/20/2019 06:36
Chlorobenzene	U		0.40	1.0	µg/L	1	9/20/2019 06:36
Chloroethane	U		0.68	1.0	µg/L	1	9/20/2019 06:36
Chloroform	U		0.46	1.0	µg/L	1	9/20/2019 06:36
Chloromethane	**1.2**		**0.83**	**1.0**	**µg/L**	1	9/20/2019 06:36
cis-1,2-Dichloroethene	U		0.42	1.0	µg/L	1	9/20/2019 06:36
cis-1,3-Dichloropropene	U		0.57	1.0	µg/L	1	9/20/2019 06:36
Dibromochloromethane	U		0.40	1.0	µg/L	1	9/20/2019 06:36
Dibromomethane	U		0.65	1.0	µg/L	1	9/20/2019 06:36
Dichlorodifluoromethane	U		0.68	1.0	µg/L	1	9/20/2019 06:36
Ethylbenzene	U		0.34	1.0	µg/L	1	9/20/2019 06:36
Hexachlorobutadiene	U		0.56	1.0	µg/L	1	9/20/2019 06:36
Hexachloroethane	U		0.45	1.0	µg/L	1	9/20/2019 06:36
Hexane	U		0.40	1.0	µg/L	1	9/20/2019 06:36
Iodomethane	U		2.0	5.0	µg/L	1	9/20/2019 06:36
Isopropylbenzene	U		0.35	1.0	µg/L	1	9/20/2019 06:36
m,p-Xylene	U		0.81	2.0	µg/L	1	9/20/2019 06:36
Methyl tert-butyl ether	U		0.45	1.0	µg/L	1	9/20/2019 06:36
Methylene chloride	U		0.86	5.0	µg/L	1	9/20/2019 06:36
Naphthalene	U		0.77	5.0	µg/L	1	9/20/2019 06:36
n-Butylbenzene	U		0.34	1.0	µg/L	1	9/20/2019 06:36
n-Propylbenzene	U		0.48	1.0	µg/L	1	9/20/2019 06:36
o-Xylene	U		0.31	1.0	µg/L	1	9/20/2019 06:36
p-Isopropyltoluene	U		0.26	1.0	µg/L	1	9/20/2019 06:36
sec-Butylbenzene	U		0.30	1.0	µg/L	1	9/20/2019 06:36
Styrene	U		0.33	1.0	µg/L	1	9/20/2019 06:36
tert-Butyl alcohol	**6.6**	J	**2.4**	**20**	**µg/L**	1	9/20/2019 06:36
tert-Butylbenzene	U		0.39	1.0	µg/L	1	9/20/2019 06:36
Tetrachloroethene	U		0.39	1.0	µg/L	1	9/20/2019 06:36
Tetrahydrofuran	U		0.73	1.0	µg/L	1	9/20/2019 06:36
Toluene	U		0.45	1.0	µg/L	1	9/20/2019 06:36
trans-1,2-Dichloroethene	U		0.48	1.0	µg/L	1	9/20/2019 06:36
trans-1,3-Dichloropropene	U		0.38	1.0	µg/L	1	9/20/2019 06:36
trans-1,4-Dichloro-2-butene	U		0.58	2.0	µg/L	1	9/20/2019 06:36
Trichloroethene	U		0.43	1.0	µg/L	1	9/20/2019 06:36
Trichlorofluoromethane	U		0.52	1.0	µg/L	1	9/20/2019 06:36

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *25-Sep-19*

Client: BB&E, Inc.
Project: SSW Collis 2019 LTM Task 3
Sample ID: COL-GW-01
Collection Date: 9/9/2019 09:50 AM

Work Order: 19090657
Lab ID: 19090657-01
Matrix: GROUNDWATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Vinyl acetate	U		0.83	5.0	µg/L	1	9/20/2019 06:36
Vinyl chloride	U		0.53	1.0	µg/L	1	9/20/2019 06:36
Surr: 1,2-Dichloroethane-d4	*98.4*			*75-120*	*%REC*	1	9/20/2019 06:36
Surr: 4-Bromofluorobenzene	*97.4*			*80-110*	*%REC*	1	9/20/2019 06:36
Surr: Dibromofluoromethane	*96.6*			*85-115*	*%REC*	1	9/20/2019 06:36
Surr: Toluene-d8	*99.8*			*85-110*	*%REC*	1	9/20/2019 06:36

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *25-Sep-19*

Client: BB&E, Inc.
Project: SSW Collis 2019 LTM Task 3
Sample ID: COL-GW-02
Collection Date: 9/9/2019 10:20 AM

Work Order: 19090657
Lab ID: 19090657-02
Matrix: GROUNDWATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
VOLATILE ORGANIC COMPOUNDS		Method: **SW8260C**					Analyst: **MF**
1,1,1,2-Tetrachloroethane	U		0.38	1.0	µg/L	1	9/20/2019 06:59
1,1,1-Trichloroethane	U		0.46	1.0	µg/L	1	9/20/2019 06:59
1,1,2,2-Tetrachloroethane	U		0.40	1.0	µg/L	1	9/20/2019 06:59
1,1,2-Trichloroethane	U		0.46	1.0	µg/L	1	9/20/2019 06:59
1,1,2-Trichlorotrifluoroethane	U		0.52	1.0	µg/L	1	9/20/2019 06:59
1,1-Dichloroethane	U		0.44	1.0	µg/L	1	9/20/2019 06:59
1,1-Dichloroethene	U		0.40	1.0	µg/L	1	9/20/2019 06:59
1,1-Dichloropropene	U		0.37	1.0	µg/L	1	9/20/2019 06:59
1,2,3-Trichlorobenzene	U		0.42	1.0	µg/L	1	9/20/2019 06:59
1,2,3-Trichloropropane	U		0.40	1.0	µg/L	1	9/20/2019 06:59
1,2,4-Trichlorobenzene	U		0.45	1.0	µg/L	1	9/20/2019 06:59
1,2,4-Trimethylbenzene	U		0.45	1.0	µg/L	1	9/20/2019 06:59
1,2-Dibromo-3-chloropropane	U		0.43	1.0	µg/L	1	9/20/2019 06:59
1,2-Dibromoethane	U		0.41	1.0	µg/L	1	9/20/2019 06:59
1,2-Dichlorobenzene	U		0.32	1.0	µg/L	1	9/20/2019 06:59
1,2-Dichloroethane	U		0.44	1.0	µg/L	1	9/20/2019 06:59
1,2-Dichloropropane	U		0.48	1.0	µg/L	1	9/20/2019 06:59
1,3,5-Trichlorobenzene	U		0.31	1.0	µg/L	1	9/20/2019 06:59
1,3,5-Trimethylbenzene	U		0.65	1.0	µg/L	1	9/20/2019 06:59
1,3-Dichlorobenzene	U		0.33	1.0	µg/L	1	9/20/2019 06:59
1,3-Dichloropropane	U		0.40	1.0	µg/L	1	9/20/2019 06:59
1,4-Dichlorobenzene	U		0.35	1.0	µg/L	1	9/20/2019 06:59
2,2-Dichloropropane	U		0.52	1.0	µg/L	1	9/20/2019 06:59
2-Butanone	**2.3**	J	**0.52**	**5.0**	**µg/L**	1	9/20/2019 06:59
2-Chloroethyl vinyl ether	U		0.82	1.0	µg/L	1	9/20/2019 06:59
2-Chlorotoluene	U		0.36	1.0	µg/L	1	9/20/2019 06:59
2-Hexanone	U		0.59	5.0	µg/L	1	9/20/2019 06:59
2-Methylnaphthalene	U		0.66	5.0	µg/L	1	9/20/2019 06:59
4-Chlorotoluene	U		0.31	1.0	µg/L	1	9/20/2019 06:59
4-Isopropyltoluene	U		0.10	1.0	µg/L	1	9/20/2019 06:59
4-Methyl-2-pentanone	U		0.52	1.0	µg/L	1	9/20/2019 06:59
Acetone	**9.4**	J	**1.1**	**10**	**µg/L**	1	9/20/2019 06:59
Acrolein	U		0.38	1.0	µg/L	1	9/20/2019 06:59
Acrylonitrile	U		0.50	1.0	µg/L	1	9/20/2019 06:59
Benzene	U		0.46	1.0	µg/L	1	9/20/2019 06:59
Benzyl chloride	U		0.34	1.0	µg/L	1	9/20/2019 06:59
Bromobenzene	U		0.38	1.0	µg/L	1	9/20/2019 06:59
Bromochloromethane	U		0.45	1.0	µg/L	1	9/20/2019 06:59

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *25-Sep-19*

Client: BB&E, Inc.
Project: SSW Collis 2019 LTM Task 3
Sample ID: COL-GW-02
Collection Date: 9/9/2019 10:20 AM

Work Order: 19090657
Lab ID: 19090657-02
Matrix: GROUNDWATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Bromodichloromethane	U		0.49	1.0	µg/L	1	9/20/2019 06:59
Bromoform	U		0.56	1.0	µg/L	1	9/20/2019 06:59
Bromomethane	U		0.90	1.0	µg/L	1	9/20/2019 06:59
Carbon disulfide	U		0.49	1.0	µg/L	1	9/20/2019 06:59
Carbon tetrachloride	U		0.40	1.0	µg/L	1	9/20/2019 06:59
Chlorobenzene	U		0.40	1.0	µg/L	1	9/20/2019 06:59
Chloroethane	U		0.68	1.0	µg/L	1	9/20/2019 06:59
Chloroform	U		0.46	1.0	µg/L	1	9/20/2019 06:59
Chloromethane	**0.91**	J	**0.83**	**1.0**	**µg/L**	1	9/20/2019 06:59
cis-1,2-Dichloroethene	U		0.42	1.0	µg/L	1	9/20/2019 06:59
cis-1,3-Dichloropropene	U		0.57	1.0	µg/L	1	9/20/2019 06:59
Dibromochloromethane	U		0.40	1.0	µg/L	1	9/20/2019 06:59
Dibromomethane	U		0.65	1.0	µg/L	1	9/20/2019 06:59
Dichlorodifluoromethane	U		0.68	1.0	µg/L	1	9/20/2019 06:59
Ethylbenzene	U		0.34	1.0	µg/L	1	9/20/2019 06:59
Hexachlorobutadiene	U		0.56	1.0	µg/L	1	9/20/2019 06:59
Hexachloroethane	U		0.45	1.0	µg/L	1	9/20/2019 06:59
Hexane	U		0.40	1.0	µg/L	1	9/20/2019 06:59
Iodomethane	U		2.0	5.0	µg/L	1	9/20/2019 06:59
Isopropylbenzene	U		0.35	1.0	µg/L	1	9/20/2019 06:59
m,p-Xylene	U		0.81	2.0	µg/L	1	9/20/2019 06:59
Methyl tert-butyl ether	U		0.45	1.0	µg/L	1	9/20/2019 06:59
Methylene chloride	U		0.86	5.0	µg/L	1	9/20/2019 06:59
Naphthalene	U		0.77	5.0	µg/L	1	9/20/2019 06:59
n-Butylbenzene	U		0.34	1.0	µg/L	1	9/20/2019 06:59
n-Propylbenzene	U		0.48	1.0	µg/L	1	9/20/2019 06:59
o-Xylene	U		0.31	1.0	µg/L	1	9/20/2019 06:59
p-Isopropyltoluene	U		0.26	1.0	µg/L	1	9/20/2019 06:59
sec-Butylbenzene	U		0.30	1.0	µg/L	1	9/20/2019 06:59
Styrene	U		0.33	1.0	µg/L	1	9/20/2019 06:59
tert-Butyl alcohol	**4.0**	J	**2.4**	**20**	**µg/L**	1	9/20/2019 06:59
tert-Butylbenzene	U		0.39	1.0	µg/L	1	9/20/2019 06:59
Tetrachloroethene	U		0.39	1.0	µg/L	1	9/20/2019 06:59
Tetrahydrofuran	U		0.73	1.0	µg/L	1	9/20/2019 06:59
Toluene	U		0.45	1.0	µg/L	1	9/20/2019 06:59
trans-1,2-Dichloroethene	U		0.48	1.0	µg/L	1	9/20/2019 06:59
trans-1,3-Dichloropropene	U		0.38	1.0	µg/L	1	9/20/2019 06:59
trans-1,4-Dichloro-2-butene	U		0.58	2.0	µg/L	1	9/20/2019 06:59
Trichloroethene	U		0.43	1.0	µg/L	1	9/20/2019 06:59
Trichlorofluoromethane	U		0.52	1.0	µg/L	1	9/20/2019 06:59

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *25-Sep-19*

Client: BB&E, Inc.
Project: SSW Collis 2019 LTM Task 3
Sample ID: COL-GW-02
Collection Date: 9/9/2019 10:20 AM

Work Order: 19090657
Lab ID: 19090657-02
Matrix: GROUNDWATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Vinyl acetate	U		0.83	5.0	µg/L	1	9/20/2019 06:59
Vinyl chloride	U		0.53	1.0	µg/L	1	9/20/2019 06:59
Surr: 1,2-Dichloroethane-d4	*99.8*			*75-120*	*%REC*	1	9/20/2019 06:59
Surr: 4-Bromofluorobenzene	*94.6*			*80-110*	*%REC*	1	9/20/2019 06:59
Surr: Dibromofluoromethane	*92.2*			*85-115*	*%REC*	1	9/20/2019 06:59
Surr: Toluene-d8	*97.2*			*85-110*	*%REC*	1	9/20/2019 06:59

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *25-Sep-19*

Client: BB&E, Inc.
Project: SSW Collis 2019 LTM Task 3
Sample ID: COL-GW-03
Collection Date: 9/9/2019 10:50 AM

Work Order: 19090657
Lab ID: 19090657-03
Matrix: GROUNDWATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
VOLATILE ORGANIC COMPOUNDS		Method: **SW8260C**					Analyst: **MF**
1,1,1,2-Tetrachloroethane	U		0.38	1.0	µg/L	1	9/20/2019 07:21
1,1,1-Trichloroethane	U		0.46	1.0	µg/L	1	9/20/2019 07:21
1,1,2,2-Tetrachloroethane	U		0.40	1.0	µg/L	1	9/20/2019 07:21
1,1,2-Trichloroethane	U		0.46	1.0	µg/L	1	9/20/2019 07:21
1,1,2-Trichlorotrifluoroethane	U		0.52	1.0	µg/L	1	9/20/2019 07:21
1,1-Dichloroethane	U		0.44	1.0	µg/L	1	9/20/2019 07:21
1,1-Dichloroethene	U		0.40	1.0	µg/L	1	9/20/2019 07:21
1,1-Dichloropropene	U		0.37	1.0	µg/L	1	9/20/2019 07:21
1,2,3-Trichlorobenzene	U		0.42	1.0	µg/L	1	9/20/2019 07:21
1,2,3-Trichloropropane	U		0.40	1.0	µg/L	1	9/20/2019 07:21
1,2,4-Trichlorobenzene	U		0.45	1.0	µg/L	1	9/20/2019 07:21
1,2,4-Trimethylbenzene	U		0.45	1.0	µg/L	1	9/20/2019 07:21
1,2-Dibromo-3-chloropropane	U		0.43	1.0	µg/L	1	9/20/2019 07:21
1,2-Dibromoethane	U		0.41	1.0	µg/L	1	9/20/2019 07:21
1,2-Dichlorobenzene	U		0.32	1.0	µg/L	1	9/20/2019 07:21
1,2-Dichloroethane	U		0.44	1.0	µg/L	1	9/20/2019 07:21
1,2-Dichloropropane	U		0.48	1.0	µg/L	1	9/20/2019 07:21
1,3,5-Trichlorobenzene	U		0.31	1.0	µg/L	1	9/20/2019 07:21
1,3,5-Trimethylbenzene	U		0.65	1.0	µg/L	1	9/20/2019 07:21
1,3-Dichlorobenzene	U		0.33	1.0	µg/L	1	9/20/2019 07:21
1,3-Dichloropropane	U		0.40	1.0	µg/L	1	9/20/2019 07:21
1,4-Dichlorobenzene	U		0.35	1.0	µg/L	1	9/20/2019 07:21
2,2-Dichloropropane	U		0.52	1.0	µg/L	1	9/20/2019 07:21
2-Butanone	**1.1**	J	**0.52**	**5.0**	**µg/L**	1	9/20/2019 07:21
2-Chloroethyl vinyl ether	U		0.82	1.0	µg/L	1	9/20/2019 07:21
2-Chlorotoluene	U		0.36	1.0	µg/L	1	9/20/2019 07:21
2-Hexanone	U		0.59	5.0	µg/L	1	9/20/2019 07:21
2-Methylnaphthalene	U		0.66	5.0	µg/L	1	9/20/2019 07:21
4-Chlorotoluene	U		0.31	1.0	µg/L	1	9/20/2019 07:21
4-Isopropyltoluene	U		0.10	1.0	µg/L	1	9/20/2019 07:21
4-Methyl-2-pentanone	U		0.52	1.0	µg/L	1	9/20/2019 07:21
Acetone	**6.2**	J	**1.1**	**10**	**µg/L**	1	9/20/2019 07:21
Acrolein	U		0.38	1.0	µg/L	1	9/20/2019 07:21
Acrylonitrile	U		0.50	1.0	µg/L	1	9/20/2019 07:21
Benzene	U		0.46	1.0	µg/L	1	9/20/2019 07:21
Benzyl chloride	U		0.34	1.0	µg/L	1	9/20/2019 07:21
Bromobenzene	U		0.38	1.0	µg/L	1	9/20/2019 07:21
Bromochloromethane	U		0.45	1.0	µg/L	1	9/20/2019 07:21

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *25-Sep-19*

Client: BB&E, Inc.
Project: SSW Collis 2019 LTM Task 3
Sample ID: COL-GW-03
Collection Date: 9/9/2019 10:50 AM

Work Order: 19090657
Lab ID: 19090657-03
Matrix: GROUNDWATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Bromodichloromethane	U		0.49	1.0	µg/L	1	9/20/2019 07:21
Bromoform	U		0.56	1.0	µg/L	1	9/20/2019 07:21
Bromomethane	U		0.90	1.0	µg/L	1	9/20/2019 07:21
Carbon disulfide	**0.53**	J	**0.49**	**1.0**	**µg/L**	1	9/20/2019 07:21
Carbon tetrachloride	U		0.40	1.0	µg/L	1	9/20/2019 07:21
Chlorobenzene	U		0.40	1.0	µg/L	1	9/20/2019 07:21
Chloroethane	U		0.68	1.0	µg/L	1	9/20/2019 07:21
Chloroform	U		0.46	1.0	µg/L	1	9/20/2019 07:21
Chloromethane	U		0.83	1.0	µg/L	1	9/20/2019 07:21
cis-1,2-Dichloroethene	U		0.42	1.0	µg/L	1	9/20/2019 07:21
cis-1,3-Dichloropropene	U		0.57	1.0	µg/L	1	9/20/2019 07:21
Dibromochloromethane	U		0.40	1.0	µg/L	1	9/20/2019 07:21
Dibromomethane	U		0.65	1.0	µg/L	1	9/20/2019 07:21
Dichlorodifluoromethane	U		0.68	1.0	µg/L	1	9/20/2019 07:21
Ethylbenzene	U		0.34	1.0	µg/L	1	9/20/2019 07:21
Hexachlorobutadiene	U		0.56	1.0	µg/L	1	9/20/2019 07:21
Hexachloroethane	U		0.45	1.0	µg/L	1	9/20/2019 07:21
Hexane	U		0.40	1.0	µg/L	1	9/20/2019 07:21
Iodomethane	U		2.0	5.0	µg/L	1	9/20/2019 07:21
Isopropylbenzene	U		0.35	1.0	µg/L	1	9/20/2019 07:21
m,p-Xylene	U		0.81	2.0	µg/L	1	9/20/2019 07:21
Methyl tert-butyl ether	U		0.45	1.0	µg/L	1	9/20/2019 07:21
Methylene chloride	U		0.86	5.0	µg/L	1	9/20/2019 07:21
Naphthalene	U		0.77	5.0	µg/L	1	9/20/2019 07:21
n-Butylbenzene	U		0.34	1.0	µg/L	1	9/20/2019 07:21
n-Propylbenzene	U		0.48	1.0	µg/L	1	9/20/2019 07:21
o-Xylene	U		0.31	1.0	µg/L	1	9/20/2019 07:21
p-Isopropyltoluene	U		0.26	1.0	µg/L	1	9/20/2019 07:21
sec-Butylbenzene	U		0.30	1.0	µg/L	1	9/20/2019 07:21
Styrene	U		0.33	1.0	µg/L	1	9/20/2019 07:21
tert-Butyl alcohol	**3.0**	J	**2.4**	**20**	**µg/L**	1	9/20/2019 07:21
tert-Butylbenzene	U		0.39	1.0	µg/L	1	9/20/2019 07:21
Tetrachloroethene	U		0.39	1.0	µg/L	1	9/20/2019 07:21
Tetrahydrofuran	U		0.73	1.0	µg/L	1	9/20/2019 07:21
Toluene	U		0.45	1.0	µg/L	1	9/20/2019 07:21
trans-1,2-Dichloroethene	U		0.48	1.0	µg/L	1	9/20/2019 07:21
trans-1,3-Dichloropropene	U		0.38	1.0	µg/L	1	9/20/2019 07:21
trans-1,4-Dichloro-2-butene	U		0.58	2.0	µg/L	1	9/20/2019 07:21
Trichloroethene	U		0.43	1.0	µg/L	1	9/20/2019 07:21
Trichlorofluoromethane	U		0.52	1.0	µg/L	1	9/20/2019 07:21

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *25-Sep-19*

Client: BB&E, Inc.
Project: SSW Collis 2019 LTM Task 3
Sample ID: COL-GW-03
Collection Date: 9/9/2019 10:50 AM

Work Order: 19090657
Lab ID: 19090657-03
Matrix: GROUNDWATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Vinyl acetate	U		0.83	5.0	µg/L	1	9/20/2019 07:21
Vinyl chloride	U		0.53	1.0	µg/L	1	9/20/2019 07:21
Surr: 1,2-Dichloroethane-d4	*102*			*75-120*	*%REC*	1	9/20/2019 07:21
Surr: 4-Bromofluorobenzene	*97.0*			*80-110*	*%REC*	1	9/20/2019 07:21
Surr: Dibromofluoromethane	*94.6*			*85-115*	*%REC*	1	9/20/2019 07:21
Surr: Toluene-d8	*102*			*85-110*	*%REC*	1	9/20/2019 07:21

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *25-Sep-19*

Client: BB&E, Inc.
Project: SSW Collis 2019 LTM Task 3
Sample ID: COL-GW-04
Collection Date: 9/9/2019 11:50 AM

Work Order: 19090657
Lab ID: 19090657-04
Matrix: GROUNDWATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
1,4-DIOXANE BY SELECT ION MONITORING			Method: **SW8260B**				Analyst: **BG**
1,4-Dioxane	U		0.44	0.60	µg/L	1	9/20/2019 11:40
Surr: Toluene-d8	*111*			*74-124*	*%REC*	1	9/20/2019 11:40
VOLATILE ORGANIC COMPOUNDS			Method: **SW8260C**				Analyst: **MF**
1,1,1,2-Tetrachloroethane	U		0.38	1.0	µg/L	1	9/20/2019 07:43
1,1,1-Trichloroethane	U		0.46	1.0	µg/L	1	9/20/2019 07:43
1,1,2,2-Tetrachloroethane	U		0.40	1.0	µg/L	1	9/20/2019 07:43
1,1,2-Trichloroethane	U		0.46	1.0	µg/L	1	9/20/2019 07:43
1,1,2-Trichlorotrifluoroethane	U		0.52	1.0	µg/L	1	9/20/2019 07:43
1,1-Dichloroethane	U		0.44	1.0	µg/L	1	9/20/2019 07:43
1,1-Dichloroethene	U		0.40	1.0	µg/L	1	9/20/2019 07:43
1,1-Dichloropropene	U		0.37	1.0	µg/L	1	9/20/2019 07:43
1,2,3-Trichlorobenzene	U		0.42	1.0	µg/L	1	9/20/2019 07:43
1,2,3-Trichloropropane	U		0.40	1.0	µg/L	1	9/20/2019 07:43
1,2,4-Trichlorobenzene	U		0.45	1.0	µg/L	1	9/20/2019 07:43
1,2,4-Trimethylbenzene	U		0.45	1.0	µg/L	1	9/20/2019 07:43
1,2-Dibromo-3-chloropropane	U		0.43	1.0	µg/L	1	9/20/2019 07:43
1,2-Dibromoethane	U		0.41	1.0	µg/L	1	9/20/2019 07:43
1,2-Dichlorobenzene	U		0.32	1.0	µg/L	1	9/20/2019 07:43
1,2-Dichloroethane	U		0.44	1.0	µg/L	1	9/20/2019 07:43
1,2-Dichloropropane	U		0.48	1.0	µg/L	1	9/20/2019 07:43
1,3,5-Trichlorobenzene	U		0.31	1.0	µg/L	1	9/20/2019 07:43
1,3,5-Trimethylbenzene	U		0.65	1.0	µg/L	1	9/20/2019 07:43
1,3-Dichlorobenzene	U		0.33	1.0	µg/L	1	9/20/2019 07:43
1,3-Dichloropropane	U		0.40	1.0	µg/L	1	9/20/2019 07:43
1,4-Dichlorobenzene	U		0.35	1.0	µg/L	1	9/20/2019 07:43
2,2-Dichloropropane	U		0.52	1.0	µg/L	1	9/20/2019 07:43
2-Butanone	**1.7**	J	**0.52**	**5.0**	**µg/L**	1	9/20/2019 07:43
2-Chloroethyl vinyl ether	U		0.82	1.0	µg/L	1	9/20/2019 07:43
2-Chlorotoluene	U		0.36	1.0	µg/L	1	9/20/2019 07:43
2-Hexanone	U		0.59	5.0	µg/L	1	9/20/2019 07:43
2-Methylnaphthalene	U		0.66	5.0	µg/L	1	9/20/2019 07:43
4-Chlorotoluene	U		0.31	1.0	µg/L	1	9/20/2019 07:43
4-Isopropyltoluene	U		0.10	1.0	µg/L	1	9/20/2019 07:43
4-Methyl-2-pentanone	U		0.52	1.0	µg/L	1	9/20/2019 07:43
Acetone	**5.9**	J	**1.1**	**10**	**µg/L**	1	9/20/2019 07:43
Acrolein	U		0.38	1.0	µg/L	1	9/20/2019 07:43
Acrylonitrile	U		0.50	1.0	µg/L	1	9/20/2019 07:43
Benzene	U		0.46	1.0	µg/L	1	9/20/2019 07:43

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *25-Sep-19*

Client: BB&E, Inc.
Project: SSW Collis 2019 LTM Task 3
Sample ID: COL-GW-04
Collection Date: 9/9/2019 11:50 AM

Work Order: 19090657
Lab ID: 19090657-04
Matrix: GROUNDWATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Benzyl chloride	U		0.34	1.0	µg/L	1	9/20/2019 07:43
Bromobenzene	U		0.38	1.0	µg/L	1	9/20/2019 07:43
Bromochloromethane	U		0.45	1.0	µg/L	1	9/20/2019 07:43
Bromodichloromethane	U		0.49	1.0	µg/L	1	9/20/2019 07:43
Bromoform	U		0.56	1.0	µg/L	1	9/20/2019 07:43
Bromomethane	U		0.90	1.0	µg/L	1	9/20/2019 07:43
Carbon disulfide	U		0.49	1.0	µg/L	1	9/20/2019 07:43
Carbon tetrachloride	U		0.40	1.0	µg/L	1	9/20/2019 07:43
Chlorobenzene	U		0.40	1.0	µg/L	1	9/20/2019 07:43
Chloroethane	U		0.68	1.0	µg/L	1	9/20/2019 07:43
Chloroform	U		0.46	1.0	µg/L	1	9/20/2019 07:43
Chloromethane	U		0.83	1.0	µg/L	1	9/20/2019 07:43
cis-1,2-Dichloroethene	**85**		**0.42**	**1.0**	**µg/L**	1	9/20/2019 07:43
cis-1,3-Dichloropropene	U		0.57	1.0	µg/L	1	9/20/2019 07:43
Dibromochloromethane	U		0.40	1.0	µg/L	1	9/20/2019 07:43
Dibromomethane	U		0.65	1.0	µg/L	1	9/20/2019 07:43
Dichlorodifluoromethane	U		0.68	1.0	µg/L	1	9/20/2019 07:43
Ethylbenzene	U		0.34	1.0	µg/L	1	9/20/2019 07:43
Hexachlorobutadiene	U		0.56	1.0	µg/L	1	9/20/2019 07:43
Hexachloroethane	U		0.45	1.0	µg/L	1	9/20/2019 07:43
Hexane	U		0.40	1.0	µg/L	1	9/20/2019 07:43
Iodomethane	U		2.0	5.0	µg/L	1	9/20/2019 07:43
Isopropylbenzene	U		0.35	1.0	µg/L	1	9/20/2019 07:43
m,p-Xylene	U		0.81	2.0	µg/L	1	9/20/2019 07:43
Methyl tert-butyl ether	U		0.45	1.0	µg/L	1	9/20/2019 07:43
Methylene chloride	U		0.86	5.0	µg/L	1	9/20/2019 07:43
Naphthalene	U		0.77	5.0	µg/L	1	9/20/2019 07:43
n-Butylbenzene	U		0.34	1.0	µg/L	1	9/20/2019 07:43
n-Propylbenzene	U		0.48	1.0	µg/L	1	9/20/2019 07:43
o-Xylene	U		0.31	1.0	µg/L	1	9/20/2019 07:43
p-Isopropyltoluene	U		0.26	1.0	µg/L	1	9/20/2019 07:43
sec-Butylbenzene	U		0.30	1.0	µg/L	1	9/20/2019 07:43
Styrene	U		0.33	1.0	µg/L	1	9/20/2019 07:43
tert-Butyl alcohol	U		2.4	20	µg/L	1	9/20/2019 07:43
tert-Butylbenzene	U		0.39	1.0	µg/L	1	9/20/2019 07:43
Tetrachloroethene	U		0.39	1.0	µg/L	1	9/20/2019 07:43
Tetrahydrofuran	U		0.73	1.0	µg/L	1	9/20/2019 07:43
Toluene	U		0.45	1.0	µg/L	1	9/20/2019 07:43
trans-1,2-Dichloroethene	**1.9**		**0.48**	**1.0**	**µg/L**	1	9/20/2019 07:43
trans-1,3-Dichloropropene	U		0.38	1.0	µg/L	1	9/20/2019 07:43

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *25-Sep-19*

Client: BB&E, Inc.
Project: SSW Collis 2019 LTM Task 3
Sample ID: COL-GW-04
Collection Date: 9/9/2019 11:50 AM

Work Order: 19090657
Lab ID: 19090657-04
Matrix: GROUNDWATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
trans-1,4-Dichloro-2-butene	U		0.58	2.0	µg/L	1	9/20/2019 07:43
Trichloroethene	**3.2**		**0.43**	**1.0**	**µg/L**	1	9/20/2019 07:43
Trichlorofluoromethane	U		0.52	1.0	µg/L	1	9/20/2019 07:43
Vinyl acetate	U		0.83	5.0	µg/L	1	9/20/2019 07:43
Vinyl chloride	**4.7**		**0.53**	**1.0**	**µg/L**	1	9/20/2019 07:43
Surr: 1,2-Dichloroethane-d4	*99.2*			*75-120*	*%REC*	1	9/20/2019 07:43
Surr: 4-Bromofluorobenzene	*96.0*			*80-110*	*%REC*	1	9/20/2019 07:43
Surr: Dibromofluoromethane	*95.2*			*85-115*	*%REC*	1	9/20/2019 07:43
Surr: Toluene-d8	*99.3*			*85-110*	*%REC*	1	9/20/2019 07:43

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *25-Sep-19*

Client: BB&E, Inc.
Project: SSW Collis 2019 LTM Task 3
Sample ID: COL-GW-05
Collection Date: 9/9/2019 12:30 PM

Work Order: 19090657
Lab ID: 19090657-05
Matrix: GROUNDWATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
GASES IN WATER			Method: **RSK-175**				Analyst: **KB**
Ethane	U		1.5	5.0	µg/L	1	9/23/2019 14:39
Ethene	U		2.7	5.0	µg/L	1	9/23/2019 14:39
Methane	**12**		**3.3**	**5.0**	**µg/L**	1	9/23/2019 14:39
METALS BY ICP-MS (DISSOLVED)			Method: **SW6020A**		Prep: FILTER / 9/20/19		Analyst: **STP**
Iron	**0.27**		**0.050**	**0.080**	**mg/L**	1	9/20/2019 16:38
Manganese	**0.048**		**0.0025**	**0.0050**	**mg/L**	1	9/20/2019 16:38
1,4-DIOXANE BY SELECT ION MONITORING			Method: **SW8260B**				Analyst: **AK**
1,4-Dioxane	U		0.44	0.60	µg/L	1	9/17/2019 20:23
Surr: Toluene-d8	*112*			*74-124*	*%REC*	1	9/17/2019 20:23
VOLATILE ORGANIC COMPOUNDS			Method: **SW8260C**				Analyst: **MF**
1,1,1,2-Tetrachloroethane	U		0.38	1.0	µg/L	1	9/20/2019 08:05
1,1,1-Trichloroethane	U		0.46	1.0	µg/L	1	9/20/2019 08:05
1,1,2,2-Tetrachloroethane	U		0.40	1.0	µg/L	1	9/20/2019 08:05
1,1,2-Trichloroethane	U		0.46	1.0	µg/L	1	9/20/2019 08:05
1,1,2-Trichlorotrifluoroethane	U		0.52	1.0	µg/L	1	9/20/2019 08:05
1,1-Dichloroethane	U		0.44	1.0	µg/L	1	9/20/2019 08:05
1,1-Dichloroethene	U		0.40	1.0	µg/L	1	9/20/2019 08:05
1,1-Dichloropropene	U		0.37	1.0	µg/L	1	9/20/2019 08:05
1,2,3-Trichlorobenzene	U		0.42	1.0	µg/L	1	9/20/2019 08:05
1,2,3-Trichloropropane	U		0.40	1.0	µg/L	1	9/20/2019 08:05
1,2,4-Trichlorobenzene	U		0.45	1.0	µg/L	1	9/20/2019 08:05
1,2,4-Trimethylbenzene	U		0.45	1.0	µg/L	1	9/20/2019 08:05
1,2-Dibromo-3-chloropropane	U		0.43	1.0	µg/L	1	9/20/2019 08:05
1,2-Dibromoethane	U		0.41	1.0	µg/L	1	9/20/2019 08:05
1,2-Dichlorobenzene	U		0.32	1.0	µg/L	1	9/20/2019 08:05
1,2-Dichloroethane	U		0.44	1.0	µg/L	1	9/20/2019 08:05
1,2-Dichloropropane	U		0.48	1.0	µg/L	1	9/20/2019 08:05
1,3,5-Trichlorobenzene	U		0.31	1.0	µg/L	1	9/20/2019 08:05
1,3,5-Trimethylbenzene	U		0.65	1.0	µg/L	1	9/20/2019 08:05
1,3-Dichlorobenzene	U		0.33	1.0	µg/L	1	9/20/2019 08:05
1,3-Dichloropropane	U		0.40	1.0	µg/L	1	9/20/2019 08:05
1,4-Dichlorobenzene	U		0.35	1.0	µg/L	1	9/20/2019 08:05
2,2-Dichloropropane	U		0.52	1.0	µg/L	1	9/20/2019 08:05
2-Butanone	**0.87**	J	**0.52**	**5.0**	**µg/L**	1	9/20/2019 08:05
2-Chloroethyl vinyl ether	U		0.82	1.0	µg/L	1	9/20/2019 08:05
2-Chlorotoluene	U		0.36	1.0	µg/L	1	9/20/2019 08:05
2-Hexanone	U		0.59	5.0	µg/L	1	9/20/2019 08:05

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *25-Sep-19*

Client: BB&E, Inc.
Project: SSW Collis 2019 LTM Task 3
Sample ID: COL-GW-05
Collection Date: 9/9/2019 12:30 PM

Work Order: 19090657
Lab ID: 19090657-05
Matrix: GROUNDWATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
2-Methylnaphthalene	U		0.66	5.0	µg/L	1	9/20/2019 08:05
4-Chlorotoluene	U		0.31	1.0	µg/L	1	9/20/2019 08:05
4-Isopropyltoluene	U		0.10	1.0	µg/L	1	9/20/2019 08:05
4-Methyl-2-pentanone	U		0.52	1.0	µg/L	1	9/20/2019 08:05
Acetone	**11**		**1.1**	**10**	**µg/L**	1	9/20/2019 08:05
Acrolein	U		0.38	1.0	µg/L	1	9/20/2019 08:05
Acrylonitrile	U		0.50	1.0	µg/L	1	9/20/2019 08:05
Benzene	U		0.46	1.0	µg/L	1	9/20/2019 08:05
Benzyl chloride	U		0.34	1.0	µg/L	1	9/20/2019 08:05
Bromobenzene	U		0.38	1.0	µg/L	1	9/20/2019 08:05
Bromochloromethane	U		0.45	1.0	µg/L	1	9/20/2019 08:05
Bromodichloromethane	U		0.49	1.0	µg/L	1	9/20/2019 08:05
Bromoform	U		0.56	1.0	µg/L	1	9/20/2019 08:05
Bromomethane	U		0.90	1.0	µg/L	1	9/20/2019 08:05
Carbon disulfide	U		0.49	1.0	µg/L	1	9/20/2019 08:05
Carbon tetrachloride	U		0.40	1.0	µg/L	1	9/20/2019 08:05
Chlorobenzene	U		0.40	1.0	µg/L	1	9/20/2019 08:05
Chloroethane	U		0.68	1.0	µg/L	1	9/20/2019 08:05
Chloroform	U		0.46	1.0	µg/L	1	9/20/2019 08:05
Chloromethane	U		0.83	1.0	µg/L	1	9/20/2019 08:05
cis-1,2-Dichloroethene	**11**		**0.42**	**1.0**	**µg/L**	1	9/20/2019 08:05
cis-1,3-Dichloropropene	U		0.57	1.0	µg/L	1	9/20/2019 08:05
Dibromochloromethane	U		0.40	1.0	µg/L	1	9/20/2019 08:05
Dibromomethane	U		0.65	1.0	µg/L	1	9/20/2019 08:05
Dichlorodifluoromethane	U		0.68	1.0	µg/L	1	9/20/2019 08:05
Ethylbenzene	U		0.34	1.0	µg/L	1	9/20/2019 08:05
Hexachlorobutadiene	U		0.56	1.0	µg/L	1	9/20/2019 08:05
Hexachloroethane	U		0.45	1.0	µg/L	1	9/20/2019 08:05
Hexane	U		0.40	1.0	µg/L	1	9/20/2019 08:05
Iodomethane	U		2.0	5.0	µg/L	1	9/20/2019 08:05
Isopropylbenzene	U		0.35	1.0	µg/L	1	9/20/2019 08:05
m,p-Xylene	U		0.81	2.0	µg/L	1	9/20/2019 08:05
Methyl tert-butyl ether	U		0.45	1.0	µg/L	1	9/20/2019 08:05
Methylene chloride	U		0.86	5.0	µg/L	1	9/20/2019 08:05
Naphthalene	U		0.77	5.0	µg/L	1	9/20/2019 08:05
n-Butylbenzene	U		0.34	1.0	µg/L	1	9/20/2019 08:05
n-Propylbenzene	U		0.48	1.0	µg/L	1	9/20/2019 08:05
o-Xylene	U		0.31	1.0	µg/L	1	9/20/2019 08:05
p-Isopropyltoluene	U		0.26	1.0	µg/L	1	9/20/2019 08:05
sec-Butylbenzene	U		0.30	1.0	µg/L	1	9/20/2019 08:05

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *25-Sep-19*

Client: BB&E, Inc.
Project: SSW Collis 2019 LTM Task 3
Sample ID: COL-GW-05
Collection Date: 9/9/2019 12:30 PM

Work Order: 19090657
Lab ID: 19090657-05
Matrix: GROUNDWATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Styrene	U		0.33	1.0	µg/L	1	9/20/2019 08:05
tert-Butyl alcohol	**14**	J	**2.4**	**20**	**µg/L**	1	9/20/2019 08:05
tert-Butylbenzene	U		0.39	1.0	µg/L	1	9/20/2019 08:05
Tetrachloroethene	U		0.39	1.0	µg/L	1	9/20/2019 08:05
Tetrahydrofuran	U		0.73	1.0	µg/L	1	9/20/2019 08:05
Toluene	U		0.45	1.0	µg/L	1	9/20/2019 08:05
trans-1,2-Dichloroethene	**0.56**	J	**0.48**	**1.0**	**µg/L**	1	9/20/2019 08:05
trans-1,3-Dichloropropene	U		0.38	1.0	µg/L	1	9/20/2019 08:05
trans-1,4-Dichloro-2-butene	U		0.58	2.0	µg/L	1	9/20/2019 08:05
Trichloroethene	U		0.43	1.0	µg/L	1	9/20/2019 08:05
Trichlorofluoromethane	U		0.52	1.0	µg/L	1	9/20/2019 08:05
Vinyl acetate	U		0.83	5.0	µg/L	1	9/20/2019 08:05
Vinyl chloride	U		0.53	1.0	µg/L	1	9/20/2019 08:05
Surr: 1,2-Dichloroethane-d4	*102*			*75-120*	*%REC*	1	9/20/2019 08:05
Surr: 4-Bromofluorobenzene	*95.0*			*80-110*	*%REC*	1	9/20/2019 08:05
Surr: Dibromofluoromethane	*95.8*			*85-115*	*%REC*	1	9/20/2019 08:05
Surr: Toluene-d8	*100*			*85-110*	*%REC*	1	9/20/2019 08:05
ANIONS BY ION CHROMATOGRAPHY		Method: **SW9056A**					Analyst: **JDR**
Chloride	**18**		**1.6**	**5.0**	**mg/L**	5	9/12/2019 13:53
Sulfate	**35**		**1.7**	**5.0**	**mg/L**	5	9/12/2019 13:53
NITROGEN, NITRATE-NITRITE		Method: **E353.2 R2.0**					Analyst: **JZB**
Nitrogen, Nitrate-Nitrite	U		0.012	0.020	mg/L	1	9/17/2019 11:01
SULFIDE		Method: **SW9034**					Analyst: **DNW**
Sulfide	U		0.42	1.0	mg/L	1	9/11/2019 11:00

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *25-Sep-19*

Client: BB&E, Inc.
Project: SSW Collis 2019 LTM Task 3
Sample ID: COL-GW-06
Collection Date: 9/9/2019 12:30 PM

Work Order: 19090657
Lab ID: 19090657-06
Matrix: GROUNDWATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
GASES IN WATER			Method: **RSK-175**				Analyst: **KB**
Ethane	U		1.5	5.0	µg/L	1	9/23/2019 14:41
Ethene	U		2.7	5.0	µg/L	1	9/23/2019 14:41
Methane	**14**		**3.3**	**5.0**	**µg/L**	1	9/23/2019 14:41
METALS BY ICP-MS (DISSOLVED)			Method: **SW6020A**		Prep: FILTER / 9/20/19		Analyst: **STP**
Iron	**0.51**		**0.050**	**0.080**	**mg/L**	1	9/20/2019 16:44
Manganese	**0.047**		**0.0025**	**0.0050**	**mg/L**	1	9/20/2019 16:44
1,4-DIOXANE BY SELECT ION MONITORING			Method: **SW8260B**				Analyst: **AK**
1,4-Dioxane	U		0.44	0.60	µg/L	1	9/18/2019 12:17
Surr: Toluene-d8	*117*			*74-124*	*%REC*	1	9/18/2019 12:17
VOLATILE ORGANIC COMPOUNDS			Method: **SW8260C**				Analyst: **MF**
1,1,1,2-Tetrachloroethane	U		0.38	1.0	µg/L	1	9/20/2019 08:27
1,1,1-Trichloroethane	U		0.46	1.0	µg/L	1	9/20/2019 08:27
1,1,2,2-Tetrachloroethane	U		0.40	1.0	µg/L	1	9/20/2019 08:27
1,1,2-Trichloroethane	U		0.46	1.0	µg/L	1	9/20/2019 08:27
1,1,2-Trichlorotrifluoroethane	U		0.52	1.0	µg/L	1	9/20/2019 08:27
1,1-Dichloroethane	U		0.44	1.0	µg/L	1	9/20/2019 08:27
1,1-Dichloroethene	U		0.40	1.0	µg/L	1	9/20/2019 08:27
1,1-Dichloropropene	U		0.37	1.0	µg/L	1	9/20/2019 08:27
1,2,3-Trichlorobenzene	U		0.42	1.0	µg/L	1	9/20/2019 08:27
1,2,3-Trichloropropane	U		0.40	1.0	µg/L	1	9/20/2019 08:27
1,2,4-Trichlorobenzene	U		0.45	1.0	µg/L	1	9/20/2019 08:27
1,2,4-Trimethylbenzene	U		0.45	1.0	µg/L	1	9/20/2019 08:27
1,2-Dibromo-3-chloropropane	U		0.43	1.0	µg/L	1	9/20/2019 08:27
1,2-Dibromoethane	U		0.41	1.0	µg/L	1	9/20/2019 08:27
1,2-Dichlorobenzene	U		0.32	1.0	µg/L	1	9/20/2019 08:27
1,2-Dichloroethane	U		0.44	1.0	µg/L	1	9/20/2019 08:27
1,2-Dichloropropane	U		0.48	1.0	µg/L	1	9/20/2019 08:27
1,3,5-Trichlorobenzene	U		0.31	1.0	µg/L	1	9/20/2019 08:27
1,3,5-Trimethylbenzene	U		0.65	1.0	µg/L	1	9/20/2019 08:27
1,3-Dichlorobenzene	U		0.33	1.0	µg/L	1	9/20/2019 08:27
1,3-Dichloropropane	U		0.40	1.0	µg/L	1	9/20/2019 08:27
1,4-Dichlorobenzene	U		0.35	1.0	µg/L	1	9/20/2019 08:27
2,2-Dichloropropane	U		0.52	1.0	µg/L	1	9/20/2019 08:27
2-Butanone	U		0.52	5.0	µg/L	1	9/20/2019 08:27
2-Chloroethyl vinyl ether	U		0.82	1.0	µg/L	1	9/20/2019 08:27
2-Chlorotoluene	U		0.36	1.0	µg/L	1	9/20/2019 08:27
2-Hexanone	U		0.59	5.0	µg/L	1	9/20/2019 08:27

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *25-Sep-19*

Client: BB&E, Inc.
Project: SSW Collis 2019 LTM Task 3
Sample ID: COL-GW-06
Collection Date: 9/9/2019 12:30 PM

Work Order: 19090657
Lab ID: 19090657-06
Matrix: GROUNDWATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
2-Methylnaphthalene	U		0.66	5.0	µg/L	1	9/20/2019 08:27
4-Chlorotoluene	U		0.31	1.0	µg/L	1	9/20/2019 08:27
4-Isopropyltoluene	U		0.10	1.0	µg/L	1	9/20/2019 08:27
4-Methyl-2-pentanone	U		0.52	1.0	µg/L	1	9/20/2019 08:27
Acetone	**7.4**	J	**1.1**	**10**	**µg/L**	1	9/20/2019 08:27
Acrolein	U		0.38	1.0	µg/L	1	9/20/2019 08:27
Acrylonitrile	U		0.50	1.0	µg/L	1	9/20/2019 08:27
Benzene	U		0.46	1.0	µg/L	1	9/20/2019 08:27
Benzyl chloride	U		0.34	1.0	µg/L	1	9/20/2019 08:27
Bromobenzene	U		0.38	1.0	µg/L	1	9/20/2019 08:27
Bromochloromethane	U		0.45	1.0	µg/L	1	9/20/2019 08:27
Bromodichloromethane	U		0.49	1.0	µg/L	1	9/20/2019 08:27
Bromoform	U		0.56	1.0	µg/L	1	9/20/2019 08:27
Bromomethane	U		0.90	1.0	µg/L	1	9/20/2019 08:27
Carbon disulfide	U		0.49	1.0	µg/L	1	9/20/2019 08:27
Carbon tetrachloride	U		0.40	1.0	µg/L	1	9/20/2019 08:27
Chlorobenzene	U		0.40	1.0	µg/L	1	9/20/2019 08:27
Chloroethane	U		0.68	1.0	µg/L	1	9/20/2019 08:27
Chloroform	U		0.46	1.0	µg/L	1	9/20/2019 08:27
Chloromethane	U		0.83	1.0	µg/L	1	9/20/2019 08:27
cis-1,2-Dichloroethene	**11**		**0.42**	**1.0**	**µg/L**	1	9/20/2019 08:27
cis-1,3-Dichloropropene	U		0.57	1.0	µg/L	1	9/20/2019 08:27
Dibromochloromethane	U		0.40	1.0	µg/L	1	9/20/2019 08:27
Dibromomethane	U		0.65	1.0	µg/L	1	9/20/2019 08:27
Dichlorodifluoromethane	U		0.68	1.0	µg/L	1	9/20/2019 08:27
Ethylbenzene	U		0.34	1.0	µg/L	1	9/20/2019 08:27
Hexachlorobutadiene	U		0.56	1.0	µg/L	1	9/20/2019 08:27
Hexachloroethane	U		0.45	1.0	µg/L	1	9/20/2019 08:27
Hexane	U		0.40	1.0	µg/L	1	9/20/2019 08:27
Iodomethane	U		2.0	5.0	µg/L	1	9/20/2019 08:27
Isopropylbenzene	U		0.35	1.0	µg/L	1	9/20/2019 08:27
m,p-Xylene	U		0.81	2.0	µg/L	1	9/20/2019 08:27
Methyl tert-butyl ether	U		0.45	1.0	µg/L	1	9/20/2019 08:27
Methylene chloride	U		0.86	5.0	µg/L	1	9/20/2019 08:27
Naphthalene	U		0.77	5.0	µg/L	1	9/20/2019 08:27
n-Butylbenzene	U		0.34	1.0	µg/L	1	9/20/2019 08:27
n-Propylbenzene	U		0.48	1.0	µg/L	1	9/20/2019 08:27
o-Xylene	U		0.31	1.0	µg/L	1	9/20/2019 08:27
p-Isopropyltoluene	U		0.26	1.0	µg/L	1	9/20/2019 08:27
sec-Butylbenzene	U		0.30	1.0	µg/L	1	9/20/2019 08:27

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: BB&E, Inc.
Project: SSW Collis 2019 LTM Task 3
Sample ID: COL-GW-06
Collection Date: 9/9/2019 12:30 PM

Work Order: 19090657
Lab ID: 19090657-06
Matrix: GROUNDWATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Styrene	U		0.33	1.0	µg/L	1	9/20/2019 08:27
tert-Butyl alcohol	U		2.4	20	µg/L	1	9/20/2019 08:27
tert-Butylbenzene	U		0.39	1.0	µg/L	1	9/20/2019 08:27
Tetrachloroethene	U		0.39	1.0	µg/L	1	9/20/2019 08:27
Tetrahydrofuran	U		0.73	1.0	µg/L	1	9/20/2019 08:27
Toluene	U		0.45	1.0	µg/L	1	9/20/2019 08:27
trans-1,2-Dichloroethene	**0.59**	J	**0.48**	**1.0**	**µg/L**	1	9/20/2019 08:27
trans-1,3-Dichloropropene	U		0.38	1.0	µg/L	1	9/20/2019 08:27
trans-1,4-Dichloro-2-butene	U		0.58	2.0	µg/L	1	9/20/2019 08:27
Trichloroethene	U		0.43	1.0	µg/L	1	9/20/2019 08:27
Trichlorofluoromethane	U		0.52	1.0	µg/L	1	9/20/2019 08:27
Vinyl acetate	U		0.83	5.0	µg/L	1	9/20/2019 08:27
Vinyl chloride	U		0.53	1.0	µg/L	1	9/20/2019 08:27
Surr: 1,2-Dichloroethane-d4	*103*			*75-120*	*%REC*	1	9/20/2019 08:27
Surr: 4-Bromofluorobenzene	*96.4*			*80-110*	*%REC*	1	9/20/2019 08:27
Surr: Dibromofluoromethane	*97.0*			*85-115*	*%REC*	1	9/20/2019 08:27
Surr: Toluene-d8	*97.8*			*85-110*	*%REC*	1	9/20/2019 08:27
ANIONS BY ION CHROMATOGRAPHY			Method: **SW9056A**				Analyst: **JDR**
Chloride	**18**		**1.6**	**5.0**	**mg/L**	5	9/12/2019 14:31
Sulfate	**34**		**1.7**	**5.0**	**mg/L**	5	9/12/2019 14:31
NITROGEN, NITRATE-NITRITE			Method: **E353.2 R2.0**				Analyst: **JZB**
Nitrogen, Nitrate-Nitrite	U		0.012	0.020	mg/L	1	9/17/2019 11:05
SULFIDE			Method: **SW9034**				Analyst: **DNW**
Sulfide	U		0.42	1.0	mg/L	1	9/12/2019 14:00

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *25-Sep-19*

Client: BB&E, Inc.
Project: SSW Collis 2019 LTM Task 3
Sample ID: COL-GW-07
Collection Date: 9/9/2019 01:50 PM

Work Order: 19090657
Lab ID: 19090657-07
Matrix: GROUNDWATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
VOLATILE ORGANIC COMPOUNDS		Method: **SW8260C**					Analyst: **MF**
1,1,1,2-Tetrachloroethane	U		0.38	1.0	µg/L	1	9/20/2019 08:49
1,1,1-Trichloroethane	U		0.46	1.0	µg/L	1	9/20/2019 08:49
1,1,2,2-Tetrachloroethane	U		0.40	1.0	µg/L	1	9/20/2019 08:49
1,1,2-Trichloroethane	U		0.46	1.0	µg/L	1	9/20/2019 08:49
1,1,2-Trichlorotrifluoroethane	U		0.52	1.0	µg/L	1	9/20/2019 08:49
1,1-Dichloroethane	U		0.44	1.0	µg/L	1	9/20/2019 08:49
1,1-Dichloroethene	U		0.40	1.0	µg/L	1	9/20/2019 08:49
1,1-Dichloropropene	U		0.37	1.0	µg/L	1	9/20/2019 08:49
1,2,3-Trichlorobenzene	U		0.42	1.0	µg/L	1	9/20/2019 08:49
1,2,3-Trichloropropane	U		0.40	1.0	µg/L	1	9/20/2019 08:49
1,2,4-Trichlorobenzene	U		0.45	1.0	µg/L	1	9/20/2019 08:49
1,2,4-Trimethylbenzene	U		0.45	1.0	µg/L	1	9/20/2019 08:49
1,2-Dibromo-3-chloropropane	U		0.43	1.0	µg/L	1	9/20/2019 08:49
1,2-Dibromoethane	U		0.41	1.0	µg/L	1	9/20/2019 08:49
1,2-Dichlorobenzene	U		0.32	1.0	µg/L	1	9/20/2019 08:49
1,2-Dichloroethane	U		0.44	1.0	µg/L	1	9/20/2019 08:49
1,2-Dichloropropane	U		0.48	1.0	µg/L	1	9/20/2019 08:49
1,3,5-Trichlorobenzene	U		0.31	1.0	µg/L	1	9/20/2019 08:49
1,3,5-Trimethylbenzene	U		0.65	1.0	µg/L	1	9/20/2019 08:49
1,3-Dichlorobenzene	U		0.33	1.0	µg/L	1	9/20/2019 08:49
1,3-Dichloropropane	U		0.40	1.0	µg/L	1	9/20/2019 08:49
1,4-Dichlorobenzene	U		0.35	1.0	µg/L	1	9/20/2019 08:49
2,2-Dichloropropane	U		0.52	1.0	µg/L	1	9/20/2019 08:49
2-Butanone	**1.1**	J	**0.52**	**5.0**	**µg/L**	1	9/20/2019 08:49
2-Chloroethyl vinyl ether	U		0.82	1.0	µg/L	1	9/20/2019 08:49
2-Chlorotoluene	U		0.36	1.0	µg/L	1	9/20/2019 08:49
2-Hexanone	U		0.59	5.0	µg/L	1	9/20/2019 08:49
2-Methylnaphthalene	U		0.66	5.0	µg/L	1	9/20/2019 08:49
4-Chlorotoluene	U		0.31	1.0	µg/L	1	9/20/2019 08:49
4-Isopropyltoluene	U		0.10	1.0	µg/L	1	9/20/2019 08:49
4-Methyl-2-pentanone	U		0.52	1.0	µg/L	1	9/20/2019 08:49
Acetone	**5.0**	J	**1.1**	**10**	**µg/L**	1	9/20/2019 08:49
Acrolein	U		0.38	1.0	µg/L	1	9/20/2019 08:49
Acrylonitrile	U		0.50	1.0	µg/L	1	9/20/2019 08:49
Benzene	U		0.46	1.0	µg/L	1	9/20/2019 08:49
Benzyl chloride	U		0.34	1.0	µg/L	1	9/20/2019 08:49
Bromobenzene	U		0.38	1.0	µg/L	1	9/20/2019 08:49
Bromochloromethane	U		0.45	1.0	µg/L	1	9/20/2019 08:49

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *25-Sep-19*

Client: BB&E, Inc.
Project: SSW Collis 2019 LTM Task 3
Sample ID: COL-GW-07
Collection Date: 9/9/2019 01:50 PM

Work Order: 19090657
Lab ID: 19090657-07
Matrix: GROUNDWATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Bromodichloromethane	U		0.49	1.0	µg/L	1	9/20/2019 08:49
Bromoform	U		0.56	1.0	µg/L	1	9/20/2019 08:49
Bromomethane	U		0.90	1.0	µg/L	1	9/20/2019 08:49
Carbon disulfide	U		0.49	1.0	µg/L	1	9/20/2019 08:49
Carbon tetrachloride	U		0.40	1.0	µg/L	1	9/20/2019 08:49
Chlorobenzene	U		0.40	1.0	µg/L	1	9/20/2019 08:49
Chloroethane	U		0.68	1.0	µg/L	1	9/20/2019 08:49
Chloroform	U		0.46	1.0	µg/L	1	9/20/2019 08:49
Chloromethane	U		0.83	1.0	µg/L	1	9/20/2019 08:49
cis-1,2-Dichloroethene	U		0.42	1.0	µg/L	1	9/20/2019 08:49
cis-1,3-Dichloropropene	U		0.57	1.0	µg/L	1	9/20/2019 08:49
Dibromochloromethane	U		0.40	1.0	µg/L	1	9/20/2019 08:49
Dibromomethane	U		0.65	1.0	µg/L	1	9/20/2019 08:49
Dichlorodifluoromethane	U		0.68	1.0	µg/L	1	9/20/2019 08:49
Ethylbenzene	U		0.34	1.0	µg/L	1	9/20/2019 08:49
Hexachlorobutadiene	U		0.56	1.0	µg/L	1	9/20/2019 08:49
Hexachloroethane	U		0.45	1.0	µg/L	1	9/20/2019 08:49
Hexane	U		0.40	1.0	µg/L	1	9/20/2019 08:49
Iodomethane	U		2.0	5.0	µg/L	1	9/20/2019 08:49
Isopropylbenzene	U		0.35	1.0	µg/L	1	9/20/2019 08:49
m,p-Xylene	U		0.81	2.0	µg/L	1	9/20/2019 08:49
Methyl tert-butyl ether	U		0.45	1.0	µg/L	1	9/20/2019 08:49
Methylene chloride	U		0.86	5.0	µg/L	1	9/20/2019 08:49
Naphthalene	U		0.77	5.0	µg/L	1	9/20/2019 08:49
n-Butylbenzene	U		0.34	1.0	µg/L	1	9/20/2019 08:49
n-Propylbenzene	U		0.48	1.0	µg/L	1	9/20/2019 08:49
o-Xylene	U		0.31	1.0	µg/L	1	9/20/2019 08:49
p-Isopropyltoluene	U		0.26	1.0	µg/L	1	9/20/2019 08:49
sec-Butylbenzene	U		0.30	1.0	µg/L	1	9/20/2019 08:49
Styrene	U		0.33	1.0	µg/L	1	9/20/2019 08:49
tert-Butyl alcohol	U		2.4	20	µg/L	1	9/20/2019 08:49
tert-Butylbenzene	U		0.39	1.0	µg/L	1	9/20/2019 08:49
Tetrachloroethene	U		0.39	1.0	µg/L	1	9/20/2019 08:49
Tetrahydrofuran	U		0.73	1.0	µg/L	1	9/20/2019 08:49
Toluene	U		0.45	1.0	µg/L	1	9/20/2019 08:49
trans-1,2-Dichloroethene	U		0.48	1.0	µg/L	1	9/20/2019 08:49
trans-1,3-Dichloropropene	U		0.38	1.0	µg/L	1	9/20/2019 08:49
trans-1,4-Dichloro-2-butene	U		0.58	2.0	µg/L	1	9/20/2019 08:49
Trichloroethene	U		0.43	1.0	µg/L	1	9/20/2019 08:49
Trichlorofluoromethane	U		0.52	1.0	µg/L	1	9/20/2019 08:49

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *25-Sep-19*

Client: BB&E, Inc.
Project: SSW Collis 2019 LTM Task 3
Sample ID: COL-GW-07
Collection Date: 9/9/2019 01:50 PM

Work Order: 19090657
Lab ID: 19090657-07
Matrix: GROUNDWATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Vinyl acetate	U		0.83	5.0	µg/L	1	9/20/2019 08:49
Vinyl chloride	U		0.53	1.0	µg/L	1	9/20/2019 08:49
Surr: 1,2-Dichloroethane-d4	*102*			*75-120*	*%REC*	1	9/20/2019 08:49
Surr: 4-Bromofluorobenzene	*94.4*			*80-110*	*%REC*	1	9/20/2019 08:49
Surr: Dibromofluoromethane	*97.4*			*85-115*	*%REC*	1	9/20/2019 08:49
Surr: Toluene-d8	*99.0*			*85-110*	*%REC*	1	9/20/2019 08:49

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *25-Sep-19*

Client: BB&E, Inc.
Project: SSW Collis 2019 LTM Task 3
Sample ID: COL-GW-08
Collection Date: 9/9/2019 02:30 PM

Work Order: 19090657
Lab ID: 19090657-08
Matrix: GROUNDWATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
VOLATILE ORGANIC COMPOUNDS		Method: **SW8260C**					Analyst: **MF**
1,1,1,2-Tetrachloroethane	U		0.38	1.0	µg/L	1	9/20/2019 09:11
1,1,1-Trichloroethane	U		0.46	1.0	µg/L	1	9/20/2019 09:11
1,1,2,2-Tetrachloroethane	U		0.40	1.0	µg/L	1	9/20/2019 09:11
1,1,2-Trichloroethane	U		0.46	1.0	µg/L	1	9/20/2019 09:11
1,1,2-Trichlorotrifluoroethane	U		0.52	1.0	µg/L	1	9/20/2019 09:11
1,1-Dichloroethane	U		0.44	1.0	µg/L	1	9/20/2019 09:11
1,1-Dichloroethene	U		0.40	1.0	µg/L	1	9/20/2019 09:11
1,1-Dichloropropene	U		0.37	1.0	µg/L	1	9/20/2019 09:11
1,2,3-Trichlorobenzene	U		0.42	1.0	µg/L	1	9/20/2019 09:11
1,2,3-Trichloropropane	U		0.40	1.0	µg/L	1	9/20/2019 09:11
1,2,4-Trichlorobenzene	U		0.45	1.0	µg/L	1	9/20/2019 09:11
1,2,4-Trimethylbenzene	U		0.45	1.0	µg/L	1	9/20/2019 09:11
1,2-Dibromo-3-chloropropane	U		0.43	1.0	µg/L	1	9/20/2019 09:11
1,2-Dibromoethane	U		0.41	1.0	µg/L	1	9/20/2019 09:11
1,2-Dichlorobenzene	U		0.32	1.0	µg/L	1	9/20/2019 09:11
1,2-Dichloroethane	U		0.44	1.0	µg/L	1	9/20/2019 09:11
1,2-Dichloropropane	U		0.48	1.0	µg/L	1	9/20/2019 09:11
1,3,5-Trichlorobenzene	U		0.31	1.0	µg/L	1	9/20/2019 09:11
1,3,5-Trimethylbenzene	U		0.65	1.0	µg/L	1	9/20/2019 09:11
1,3-Dichlorobenzene	U		0.33	1.0	µg/L	1	9/20/2019 09:11
1,3-Dichloropropane	U		0.40	1.0	µg/L	1	9/20/2019 09:11
1,4-Dichlorobenzene	U		0.35	1.0	µg/L	1	9/20/2019 09:11
2,2-Dichloropropane	U		0.52	1.0	µg/L	1	9/20/2019 09:11
2-Butanone	U		0.52	5.0	µg/L	1	9/20/2019 09:11
2-Chloroethyl vinyl ether	U		0.82	1.0	µg/L	1	9/20/2019 09:11
2-Chlorotoluene	U		0.36	1.0	µg/L	1	9/20/2019 09:11
2-Hexanone	U		0.59	5.0	µg/L	1	9/20/2019 09:11
2-Methylnaphthalene	U		0.66	5.0	µg/L	1	9/20/2019 09:11
4-Chlorotoluene	U		0.31	1.0	µg/L	1	9/20/2019 09:11
4-Isopropyltoluene	U		0.10	1.0	µg/L	1	9/20/2019 09:11
4-Methyl-2-pentanone	U		0.52	1.0	µg/L	1	9/20/2019 09:11
Acetone	**5.5**	J	**1.1**	**10**	**µg/L**	1	9/20/2019 09:11
Acrolein	U		0.38	1.0	µg/L	1	9/20/2019 09:11
Acrylonitrile	U		0.50	1.0	µg/L	1	9/20/2019 09:11
Benzene	U		0.46	1.0	µg/L	1	9/20/2019 09:11
Benzyl chloride	U		0.34	1.0	µg/L	1	9/20/2019 09:11
Bromobenzene	U		0.38	1.0	µg/L	1	9/20/2019 09:11
Bromochloromethane	U		0.45	1.0	µg/L	1	9/20/2019 09:11

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *25-Sep-19*

Client: BB&E, Inc.
Project: SSW Collis 2019 LTM Task 3
Sample ID: COL-GW-08
Collection Date: 9/9/2019 02:30 PM

Work Order: 19090657
Lab ID: 19090657-08
Matrix: GROUNDWATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Bromodichloromethane	U		0.49	1.0	µg/L	1	9/20/2019 09:11
Bromoform	U		0.56	1.0	µg/L	1	9/20/2019 09:11
Bromomethane	U		0.90	1.0	µg/L	1	9/20/2019 09:11
Carbon disulfide	U		0.49	1.0	µg/L	1	9/20/2019 09:11
Carbon tetrachloride	U		0.40	1.0	µg/L	1	9/20/2019 09:11
Chlorobenzene	U		0.40	1.0	µg/L	1	9/20/2019 09:11
Chloroethane	U		0.68	1.0	µg/L	1	9/20/2019 09:11
Chloroform	U		0.46	1.0	µg/L	1	9/20/2019 09:11
Chloromethane	U		0.83	1.0	µg/L	1	9/20/2019 09:11
cis-1,2-Dichloroethene	**130**		**2.1**	**5.0**	**µg/L**	5	9/20/2019 18:11
cis-1,3-Dichloropropene	U		0.57	1.0	µg/L	1	9/20/2019 09:11
Dibromochloromethane	U		0.40	1.0	µg/L	1	9/20/2019 09:11
Dibromomethane	U		0.65	1.0	µg/L	1	9/20/2019 09:11
Dichlorodifluoromethane	U		0.68	1.0	µg/L	1	9/20/2019 09:11
Ethylbenzene	U		0.34	1.0	µg/L	1	9/20/2019 09:11
Hexachlorobutadiene	U		0.56	1.0	µg/L	1	9/20/2019 09:11
Hexachloroethane	U		0.45	1.0	µg/L	1	9/20/2019 09:11
Hexane	U		0.40	1.0	µg/L	1	9/20/2019 09:11
Iodomethane	U		2.0	5.0	µg/L	1	9/20/2019 09:11
Isopropylbenzene	U		0.35	1.0	µg/L	1	9/20/2019 09:11
m,p-Xylene	U		0.81	2.0	µg/L	1	9/20/2019 09:11
Methyl tert-butyl ether	U		0.45	1.0	µg/L	1	9/20/2019 09:11
Methylene chloride	U		0.86	5.0	µg/L	1	9/20/2019 09:11
Naphthalene	U		0.77	5.0	µg/L	1	9/20/2019 09:11
n-Butylbenzene	U		0.34	1.0	µg/L	1	9/20/2019 09:11
n-Propylbenzene	U		0.48	1.0	µg/L	1	9/20/2019 09:11
o-Xylene	U		0.31	1.0	µg/L	1	9/20/2019 09:11
p-Isopropyltoluene	U		0.26	1.0	µg/L	1	9/20/2019 09:11
sec-Butylbenzene	U		0.30	1.0	µg/L	1	9/20/2019 09:11
Styrene	U		0.33	1.0	µg/L	1	9/20/2019 09:11
tert-Butyl alcohol	U		2.4	20	µg/L	1	9/20/2019 09:11
tert-Butylbenzene	U		0.39	1.0	µg/L	1	9/20/2019 09:11
Tetrachloroethene	U		0.39	1.0	µg/L	1	9/20/2019 09:11
Tetrahydrofuran	U		0.73	1.0	µg/L	1	9/20/2019 09:11
Toluene	U		0.45	1.0	µg/L	1	9/20/2019 09:11
trans-1,2-Dichloroethene	**3.6**		**0.48**	**1.0**	**µg/L**	1	9/20/2019 09:11
trans-1,3-Dichloropropene	U		0.38	1.0	µg/L	1	9/20/2019 09:11
trans-1,4-Dichloro-2-butene	U		0.58	2.0	µg/L	1	9/20/2019 09:11
Trichloroethene	U		0.43	1.0	µg/L	1	9/20/2019 09:11
Trichlorofluoromethane	U		0.52	1.0	µg/L	1	9/20/2019 09:11

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *25-Sep-19*

Client: BB&E, Inc.
Project: SSW Collis 2019 LTM Task 3
Sample ID: COL-GW-08
Collection Date: 9/9/2019 02:30 PM

Work Order: 19090657
Lab ID: 19090657-08
Matrix: GROUNDWATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Vinyl acetate	U		0.83	5.0	µg/L	1	9/20/2019 09:11
Vinyl chloride	**83**		**0.53**	**1.0**	**µg/L**	1	9/20/2019 09:11
Surr: 1,2-Dichloroethane-d4	*98.8*			*75-120*	*%REC*	1	9/20/2019 09:11
Surr: 1,2-Dichloroethane-d4	*103*			*75-120*	*%REC*	5	9/20/2019 18:11
Surr: 4-Bromofluorobenzene	*98.6*			*80-110*	*%REC*	1	9/20/2019 09:11
Surr: 4-Bromofluorobenzene	*92.9*			*80-110*	*%REC*	5	9/20/2019 18:11
Surr: Dibromofluoromethane	*93.2*			*85-115*	*%REC*	1	9/20/2019 09:11
Surr: Dibromofluoromethane	*95.2*			*85-115*	*%REC*	5	9/20/2019 18:11
Surr: Toluene-d8	*101*			*85-110*	*%REC*	1	9/20/2019 09:11
Surr: Toluene-d8	*99.2*			*85-110*	*%REC*	5	9/20/2019 18:11

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *25-Sep-19*

Client: BB&E, Inc.
Project: SSW Collis 2019 LTM Task 3
Sample ID: COL-GW-09
Collection Date: 9/9/2019 02:55 PM

Work Order: 19090657
Lab ID: 19090657-09
Matrix: GROUNDWATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
VOLATILE ORGANIC COMPOUNDS		Method: **SW8260C**					Analyst: **MF**
1,1,1,2-Tetrachloroethane	U		0.76	2.0	µg/L	2	9/20/2019 09:33
1,1,1-Trichloroethane	U		0.92	2.0	µg/L	2	9/20/2019 09:33
1,1,2,2-Tetrachloroethane	U		0.80	2.0	µg/L	2	9/20/2019 09:33
1,1,2-Trichloroethane	U		0.92	2.0	µg/L	2	9/20/2019 09:33
1,1,2-Trichlorotrifluoroethane	U		1.0	2.0	µg/L	2	9/20/2019 09:33
1,1-Dichloroethane	U		0.88	2.0	µg/L	2	9/20/2019 09:33
1,1-Dichloroethene	U		0.80	2.0	µg/L	2	9/20/2019 09:33
1,1-Dichloropropene	U		0.74	2.0	µg/L	2	9/20/2019 09:33
1,2,3-Trichlorobenzene	U		0.84	2.0	µg/L	2	9/20/2019 09:33
1,2,3-Trichloropropane	U		0.80	2.0	µg/L	2	9/20/2019 09:33
1,2,4-Trichlorobenzene	U		0.90	2.0	µg/L	2	9/20/2019 09:33
1,2,4-Trimethylbenzene	U		0.90	2.0	µg/L	2	9/20/2019 09:33
1,2-Dibromo-3-chloropropane	U		0.86	2.0	µg/L	2	9/20/2019 09:33
1,2-Dibromoethane	U		0.82	2.0	µg/L	2	9/20/2019 09:33
1,2-Dichlorobenzene	U		0.64	2.0	µg/L	2	9/20/2019 09:33
1,2-Dichloroethane	U		0.88	2.0	µg/L	2	9/20/2019 09:33
1,2-Dichloropropane	U		0.96	2.0	µg/L	2	9/20/2019 09:33
1,3,5-Trichlorobenzene	U		0.62	2.0	µg/L	2	9/20/2019 09:33
1,3,5-Trimethylbenzene	U		1.3	2.0	µg/L	2	9/20/2019 09:33
1,3-Dichlorobenzene	U		0.66	2.0	µg/L	2	9/20/2019 09:33
1,3-Dichloropropane	U		0.80	2.0	µg/L	2	9/20/2019 09:33
1,4-Dichlorobenzene	U		0.70	2.0	µg/L	2	9/20/2019 09:33
2,2-Dichloropropane	U		1.0	2.0	µg/L	2	9/20/2019 09:33
2-Butanone	U		1.0	10	µg/L	2	9/20/2019 09:33
2-Chloroethyl vinyl ether	U		1.6	2.0	µg/L	2	9/20/2019 09:33
2-Chlorotoluene	U		0.72	2.0	µg/L	2	9/20/2019 09:33
2-Hexanone	U		1.2	10	µg/L	2	9/20/2019 09:33
2-Methylnaphthalene	U		1.3	10	µg/L	2	9/20/2019 09:33
4-Chlorotoluene	U		0.62	2.0	µg/L	2	9/20/2019 09:33
4-Isopropyltoluene	U		0.20	2.0	µg/L	2	9/20/2019 09:33
4-Methyl-2-pentanone	U		1.0	2.0	µg/L	2	9/20/2019 09:33
Acetone	**6.2**	J	**2.2**	**20**	**µg/L**	2	9/20/2019 09:33
Acrolein	U		0.76	2.0	µg/L	2	9/20/2019 09:33
Acrylonitrile	U		1.0	2.0	µg/L	2	9/20/2019 09:33
Benzene	U		0.92	2.0	µg/L	2	9/20/2019 09:33
Benzyl chloride	U		0.68	2.0	µg/L	2	9/20/2019 09:33
Bromobenzene	U		0.76	2.0	µg/L	2	9/20/2019 09:33
Bromochloromethane	U		0.90	2.0	µg/L	2	9/20/2019 09:33

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *25-Sep-19*

Client: BB&E, Inc.
Project: SSW Collis 2019 LTM Task 3
Sample ID: COL-GW-09
Collection Date: 9/9/2019 02:55 PM

Work Order: 19090657
Lab ID: 19090657-09
Matrix: GROUNDWATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Bromodichloromethane	U		0.98	2.0	µg/L	2	9/20/2019 09:33
Bromoform	U		1.1	2.0	µg/L	2	9/20/2019 09:33
Bromomethane	U		1.8	2.0	µg/L	2	9/20/2019 09:33
Carbon disulfide	U		0.98	2.0	µg/L	2	9/20/2019 09:33
Carbon tetrachloride	U		0.80	2.0	µg/L	2	9/20/2019 09:33
Chlorobenzene	U		0.80	2.0	µg/L	2	9/20/2019 09:33
Chloroethane	U		1.4	2.0	µg/L	2	9/20/2019 09:33
Chloroform	U		0.92	2.0	µg/L	2	9/20/2019 09:33
Chloromethane	U		1.7	2.0	µg/L	2	9/20/2019 09:33
cis-1,2-Dichloroethene	**2.2**		**0.84**	**2.0**	**µg/L**	2	9/20/2019 09:33
cis-1,3-Dichloropropene	U		1.1	2.0	µg/L	2	9/20/2019 09:33
Dibromochloromethane	U		0.80	2.0	µg/L	2	9/20/2019 09:33
Dibromomethane	U		1.3	2.0	µg/L	2	9/20/2019 09:33
Dichlorodifluoromethane	U		1.4	2.0	µg/L	2	9/20/2019 09:33
Ethylbenzene	U		0.68	2.0	µg/L	2	9/20/2019 09:33
Hexachlorobutadiene	U		1.1	2.0	µg/L	2	9/20/2019 09:33
Hexachloroethane	U		0.90	2.0	µg/L	2	9/20/2019 09:33
Hexane	U		0.80	2.0	µg/L	2	9/20/2019 09:33
Iodomethane	U		4.0	10	µg/L	2	9/20/2019 09:33
Isopropylbenzene	U		0.70	2.0	µg/L	2	9/20/2019 09:33
m,p-Xylene	U		1.6	4.0	µg/L	2	9/20/2019 09:33
Methyl tert-butyl ether	U		0.90	2.0	µg/L	2	9/20/2019 09:33
Methylene chloride	U		1.7	10	µg/L	2	9/20/2019 09:33
Naphthalene	U		1.5	10	µg/L	2	9/20/2019 09:33
n-Butylbenzene	U		0.68	2.0	µg/L	2	9/20/2019 09:33
n-Propylbenzene	U		0.96	2.0	µg/L	2	9/20/2019 09:33
o-Xylene	U		0.62	2.0	µg/L	2	9/20/2019 09:33
p-Isopropyltoluene	U		0.52	2.0	µg/L	2	9/20/2019 09:33
sec-Butylbenzene	U		0.60	2.0	µg/L	2	9/20/2019 09:33
Styrene	U		0.66	2.0	µg/L	2	9/20/2019 09:33
tert-Butyl alcohol	U		4.7	40	µg/L	2	9/20/2019 09:33
tert-Butylbenzene	U		0.78	2.0	µg/L	2	9/20/2019 09:33
Tetrachloroethene	U		0.78	2.0	µg/L	2	9/20/2019 09:33
Tetrahydrofuran	U		1.5	2.0	µg/L	2	9/20/2019 09:33
Toluene	U		0.90	2.0	µg/L	2	9/20/2019 09:33
trans-1,2-Dichloroethene	U		0.96	2.0	µg/L	2	9/20/2019 09:33
trans-1,3-Dichloropropene	U		0.76	2.0	µg/L	2	9/20/2019 09:33
trans-1,4-Dichloro-2-butene	U		1.2	4.0	µg/L	2	9/20/2019 09:33
Trichloroethene	U		0.86	2.0	µg/L	2	9/20/2019 09:33
Trichlorofluoromethane	U		1.0	2.0	µg/L	2	9/20/2019 09:33

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *25-Sep-19*

Client: BB&E, Inc.
Project: SSW Collis 2019 LTM Task 3
Sample ID: COL-GW-09
Collection Date: 9/9/2019 02:55 PM

Work Order: 19090657
Lab ID: 19090657-09
Matrix: GROUNDWATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Vinyl acetate	U		1.7	10	µg/L	2	9/20/2019 09:33
Vinyl chloride	U		1.1	2.0	µg/L	2	9/20/2019 09:33
Surr: 1,2-Dichloroethane-d4	*98.2*			*75-120*	*%REC*	2	9/20/2019 09:33
Surr: 4-Bromofluorobenzene	*96.5*			*80-110*	*%REC*	2	9/20/2019 09:33
Surr: Dibromofluoromethane	*93.6*			*85-115*	*%REC*	2	9/20/2019 09:33
Surr: Toluene-d8	*97.4*			*85-110*	*%REC*	2	9/20/2019 09:33

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *25-Sep-19*

Client: BB&E, Inc.
Project: SSW Collis 2019 LTM Task 3
Sample ID: COL-GW-10
Collection Date: 9/9/2019 04:00 PM

Work Order: 19090657
Lab ID: 19090657-10
Matrix: GROUNDWATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
VOLATILE ORGANIC COMPOUNDS		Method: **SW8260C**					Analyst: **MF**
1,1,1,2-Tetrachloroethane	U		0.38	1.0	µg/L	1	9/20/2019 09:55
1,1,1-Trichloroethane	U		0.46	1.0	µg/L	1	9/20/2019 09:55
1,1,2,2-Tetrachloroethane	U		0.40	1.0	µg/L	1	9/20/2019 09:55
1,1,2-Trichloroethane	U		0.46	1.0	µg/L	1	9/20/2019 09:55
1,1,2-Trichlorotrifluoroethane	U		0.52	1.0	µg/L	1	9/20/2019 09:55
1,1-Dichloroethane	U		0.44	1.0	µg/L	1	9/20/2019 09:55
1,1-Dichloroethene	U		0.40	1.0	µg/L	1	9/20/2019 09:55
1,1-Dichloropropene	U		0.37	1.0	µg/L	1	9/20/2019 09:55
1,2,3-Trichlorobenzene	U		0.42	1.0	µg/L	1	9/20/2019 09:55
1,2,3-Trichloropropane	U		0.40	1.0	µg/L	1	9/20/2019 09:55
1,2,4-Trichlorobenzene	U		0.45	1.0	µg/L	1	9/20/2019 09:55
1,2,4-Trimethylbenzene	U		0.45	1.0	µg/L	1	9/20/2019 09:55
1,2-Dibromo-3-chloropropane	U		0.43	1.0	µg/L	1	9/20/2019 09:55
1,2-Dibromoethane	U		0.41	1.0	µg/L	1	9/20/2019 09:55
1,2-Dichlorobenzene	U		0.32	1.0	µg/L	1	9/20/2019 09:55
1,2-Dichloroethane	U		0.44	1.0	µg/L	1	9/20/2019 09:55
1,2-Dichloropropane	U		0.48	1.0	µg/L	1	9/20/2019 09:55
1,3,5-Trichlorobenzene	U		0.31	1.0	µg/L	1	9/20/2019 09:55
1,3,5-Trimethylbenzene	U		0.65	1.0	µg/L	1	9/20/2019 09:55
1,3-Dichlorobenzene	U		0.33	1.0	µg/L	1	9/20/2019 09:55
1,3-Dichloropropane	U		0.40	1.0	µg/L	1	9/20/2019 09:55
1,4-Dichlorobenzene	U		0.35	1.0	µg/L	1	9/20/2019 09:55
2,2-Dichloropropane	U		0.52	1.0	µg/L	1	9/20/2019 09:55
2-Butanone	U		0.52	5.0	µg/L	1	9/20/2019 09:55
2-Chloroethyl vinyl ether	U		0.82	1.0	µg/L	1	9/20/2019 09:55
2-Chlorotoluene	U		0.36	1.0	µg/L	1	9/20/2019 09:55
2-Hexanone	U		0.59	5.0	µg/L	1	9/20/2019 09:55
2-Methylnaphthalene	U		0.66	5.0	µg/L	1	9/20/2019 09:55
4-Chlorotoluene	U		0.31	1.0	µg/L	1	9/20/2019 09:55
4-Isopropyltoluene	U		0.10	1.0	µg/L	1	9/20/2019 09:55
4-Methyl-2-pentanone	U		0.52	1.0	µg/L	1	9/20/2019 09:55
Acetone	**3.8**	J	**1.1**	**10**	**µg/L**	1	9/20/2019 09:55
Acrolein	U		0.38	1.0	µg/L	1	9/20/2019 09:55
Acrylonitrile	U		0.50	1.0	µg/L	1	9/20/2019 09:55
Benzene	U		0.46	1.0	µg/L	1	9/20/2019 09:55
Benzyl chloride	U		0.34	1.0	µg/L	1	9/20/2019 09:55
Bromobenzene	U		0.38	1.0	µg/L	1	9/20/2019 09:55
Bromochloromethane	U		0.45	1.0	µg/L	1	9/20/2019 09:55

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *25-Sep-19*

Client: BB&E, Inc.
Project: SSW Collis 2019 LTM Task 3
Sample ID: COL-GW-10
Collection Date: 9/9/2019 04:00 PM

Work Order: 19090657
Lab ID: 19090657-10
Matrix: GROUNDWATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Bromodichloromethane	U		0.49	1.0	µg/L	1	9/20/2019 09:55
Bromoform	U		0.56	1.0	µg/L	1	9/20/2019 09:55
Bromomethane	U		0.90	1.0	µg/L	1	9/20/2019 09:55
Carbon disulfide	U		0.49	1.0	µg/L	1	9/20/2019 09:55
Carbon tetrachloride	U		0.40	1.0	µg/L	1	9/20/2019 09:55
Chlorobenzene	U		0.40	1.0	µg/L	1	9/20/2019 09:55
Chloroethane	U		0.68	1.0	µg/L	1	9/20/2019 09:55
Chloroform	U		0.46	1.0	µg/L	1	9/20/2019 09:55
Chloromethane	U		0.83	1.0	µg/L	1	9/20/2019 09:55
cis-1,2-Dichloroethene	**35**		**0.42**	**1.0**	**µg/L**	1	9/20/2019 09:55
cis-1,3-Dichloropropene	U		0.57	1.0	µg/L	1	9/20/2019 09:55
Dibromochloromethane	U		0.40	1.0	µg/L	1	9/20/2019 09:55
Dibromomethane	U		0.65	1.0	µg/L	1	9/20/2019 09:55
Dichlorodifluoromethane	U		0.68	1.0	µg/L	1	9/20/2019 09:55
Ethylbenzene	U		0.34	1.0	µg/L	1	9/20/2019 09:55
Hexachlorobutadiene	U		0.56	1.0	µg/L	1	9/20/2019 09:55
Hexachloroethane	U		0.45	1.0	µg/L	1	9/20/2019 09:55
Hexane	U		0.40	1.0	µg/L	1	9/20/2019 09:55
Iodomethane	U		2.0	5.0	µg/L	1	9/20/2019 09:55
Isopropylbenzene	U		0.35	1.0	µg/L	1	9/20/2019 09:55
m,p-Xylene	U		0.81	2.0	µg/L	1	9/20/2019 09:55
Methyl tert-butyl ether	U		0.45	1.0	µg/L	1	9/20/2019 09:55
Methylene chloride	U		0.86	5.0	µg/L	1	9/20/2019 09:55
Naphthalene	U		0.77	5.0	µg/L	1	9/20/2019 09:55
n-Butylbenzene	U		0.34	1.0	µg/L	1	9/20/2019 09:55
n-Propylbenzene	U		0.48	1.0	µg/L	1	9/20/2019 09:55
o-Xylene	U		0.31	1.0	µg/L	1	9/20/2019 09:55
p-Isopropyltoluene	U		0.26	1.0	µg/L	1	9/20/2019 09:55
sec-Butylbenzene	U		0.30	1.0	µg/L	1	9/20/2019 09:55
Styrene	U		0.33	1.0	µg/L	1	9/20/2019 09:55
tert-Butyl alcohol	**8.5**	J	**2.4**	**20**	**µg/L**	1	9/20/2019 09:55
tert-Butylbenzene	U		0.39	1.0	µg/L	1	9/20/2019 09:55
Tetrachloroethene	U		0.39	1.0	µg/L	1	9/20/2019 09:55
Tetrahydrofuran	U		0.73	1.0	µg/L	1	9/20/2019 09:55
Toluene	U		0.45	1.0	µg/L	1	9/20/2019 09:55
trans-1,2-Dichloroethene	U		0.48	1.0	µg/L	1	9/20/2019 09:55
trans-1,3-Dichloropropene	U		0.38	1.0	µg/L	1	9/20/2019 09:55
trans-1,4-Dichloro-2-butene	U		0.58	2.0	µg/L	1	9/20/2019 09:55
Trichloroethene	U		0.43	1.0	µg/L	1	9/20/2019 09:55
Trichlorofluoromethane	U		0.52	1.0	µg/L	1	9/20/2019 09:55

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *25-Sep-19*

Client: BB&E, Inc.
Project: SSW Collis 2019 LTM Task 3
Sample ID: COL-GW-10
Collection Date: 9/9/2019 04:00 PM

Work Order: 19090657
Lab ID: 19090657-10
Matrix: GROUNDWATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Vinyl acetate	U		0.83	5.0	µg/L	1	9/20/2019 09:55
Vinyl chloride	**57**		**0.53**	**1.0**	**µg/L**	1	9/20/2019 09:55
Surr: 1,2-Dichloroethane-d4	*102*			*75-120*	*%REC*	1	9/20/2019 09:55
Surr: 4-Bromofluorobenzene	*93.0*			*80-110*	*%REC*	1	9/20/2019 09:55
Surr: Dibromofluoromethane	*97.5*			*85-115*	*%REC*	1	9/20/2019 09:55
Surr: Toluene-d8	*97.9*			*85-110*	*%REC*	1	9/20/2019 09:55

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *25-Sep-19*

Client: BB&E, Inc.
Project: SSW Collis 2019 LTM Task 3
Sample ID: COL-GW-11
Collection Date: 9/9/2019 04:30 PM

Work Order: 19090657
Lab ID: 19090657-11
Matrix: GROUNDWATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
VOLATILE ORGANIC COMPOUNDS		Method: **SW8260C**					Analyst: **MF**
1,1,1,2-Tetrachloroethane	U		0.38	1.0	µg/L	1	9/20/2019 10:17
1,1,1-Trichloroethane	U		0.46	1.0	µg/L	1	9/20/2019 10:17
1,1,2,2-Tetrachloroethane	U		0.40	1.0	µg/L	1	9/20/2019 10:17
1,1,2-Trichloroethane	U		0.46	1.0	µg/L	1	9/20/2019 10:17
1,1,2-Trichlorotrifluoroethane	U		0.52	1.0	µg/L	1	9/20/2019 10:17
1,1-Dichloroethane	U		0.44	1.0	µg/L	1	9/20/2019 10:17
1,1-Dichloroethene	U		0.40	1.0	µg/L	1	9/20/2019 10:17
1,1-Dichloropropene	U		0.37	1.0	µg/L	1	9/20/2019 10:17
1,2,3-Trichlorobenzene	U		0.42	1.0	µg/L	1	9/20/2019 10:17
1,2,3-Trichloropropane	U		0.40	1.0	µg/L	1	9/20/2019 10:17
1,2,4-Trichlorobenzene	U		0.45	1.0	µg/L	1	9/20/2019 10:17
1,2,4-Trimethylbenzene	U		0.45	1.0	µg/L	1	9/20/2019 10:17
1,2-Dibromo-3-chloropropane	U		0.43	1.0	µg/L	1	9/20/2019 10:17
1,2-Dibromoethane	U		0.41	1.0	µg/L	1	9/20/2019 10:17
1,2-Dichlorobenzene	U		0.32	1.0	µg/L	1	9/20/2019 10:17
1,2-Dichloroethane	U		0.44	1.0	µg/L	1	9/20/2019 10:17
1,2-Dichloropropane	U		0.48	1.0	µg/L	1	9/20/2019 10:17
1,3,5-Trichlorobenzene	U		0.31	1.0	µg/L	1	9/20/2019 10:17
1,3,5-Trimethylbenzene	U		0.65	1.0	µg/L	1	9/20/2019 10:17
1,3-Dichlorobenzene	U		0.33	1.0	µg/L	1	9/20/2019 10:17
1,3-Dichloropropane	U		0.40	1.0	µg/L	1	9/20/2019 10:17
1,4-Dichlorobenzene	U		0.35	1.0	µg/L	1	9/20/2019 10:17
2,2-Dichloropropane	U		0.52	1.0	µg/L	1	9/20/2019 10:17
2-Butanone	U		0.52	5.0	µg/L	1	9/20/2019 10:17
2-Chloroethyl vinyl ether	U		0.82	1.0	µg/L	1	9/20/2019 10:17
2-Chlorotoluene	U		0.36	1.0	µg/L	1	9/20/2019 10:17
2-Hexanone	U		0.59	5.0	µg/L	1	9/20/2019 10:17
2-Methylnaphthalene	U		0.66	5.0	µg/L	1	9/20/2019 10:17
4-Chlorotoluene	U		0.31	1.0	µg/L	1	9/20/2019 10:17
4-Isopropyltoluene	U		0.10	1.0	µg/L	1	9/20/2019 10:17
4-Methyl-2-pentanone	U		0.52	1.0	µg/L	1	9/20/2019 10:17
Acetone	**4.4**	J	**1.1**	**10**	**µg/L**	1	9/20/2019 10:17
Acrolein	U		0.38	1.0	µg/L	1	9/20/2019 10:17
Acrylonitrile	U		0.50	1.0	µg/L	1	9/20/2019 10:17
Benzene	U		0.46	1.0	µg/L	1	9/20/2019 10:17
Benzyl chloride	U		0.34	1.0	µg/L	1	9/20/2019 10:17
Bromobenzene	U		0.38	1.0	µg/L	1	9/20/2019 10:17
Bromochloromethane	U		0.45	1.0	µg/L	1	9/20/2019 10:17

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *25-Sep-19*

Client: BB&E, Inc.
Project: SSW Collis 2019 LTM Task 3
Sample ID: COL-GW-11
Collection Date: 9/9/2019 04:30 PM

Work Order: 19090657
Lab ID: 19090657-11
Matrix: GROUNDWATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Bromodichloromethane	U		0.49	1.0	µg/L	1	9/20/2019 10:17
Bromoform	U		0.56	1.0	µg/L	1	9/20/2019 10:17
Bromomethane	U		0.90	1.0	µg/L	1	9/20/2019 10:17
Carbon disulfide	U		0.49	1.0	µg/L	1	9/20/2019 10:17
Carbon tetrachloride	U		0.40	1.0	µg/L	1	9/20/2019 10:17
Chlorobenzene	U		0.40	1.0	µg/L	1	9/20/2019 10:17
Chloroethane	U		0.68	1.0	µg/L	1	9/20/2019 10:17
Chloroform	U		0.46	1.0	µg/L	1	9/20/2019 10:17
Chloromethane	U		0.83	1.0	µg/L	1	9/20/2019 10:17
cis-1,2-Dichloroethene	**6.1**		**0.42**	**1.0**	**µg/L**	1	9/20/2019 10:17
cis-1,3-Dichloropropene	U		0.57	1.0	µg/L	1	9/20/2019 10:17
Dibromochloromethane	U		0.40	1.0	µg/L	1	9/20/2019 10:17
Dibromomethane	U		0.65	1.0	µg/L	1	9/20/2019 10:17
Dichlorodifluoromethane	U		0.68	1.0	µg/L	1	9/20/2019 10:17
Ethylbenzene	U		0.34	1.0	µg/L	1	9/20/2019 10:17
Hexachlorobutadiene	U		0.56	1.0	µg/L	1	9/20/2019 10:17
Hexachloroethane	U		0.45	1.0	µg/L	1	9/20/2019 10:17
Hexane	U		0.40	1.0	µg/L	1	9/20/2019 10:17
Iodomethane	U		2.0	5.0	µg/L	1	9/20/2019 10:17
Isopropylbenzene	U		0.35	1.0	µg/L	1	9/20/2019 10:17
m,p-Xylene	U		0.81	2.0	µg/L	1	9/20/2019 10:17
Methyl tert-butyl ether	U		0.45	1.0	µg/L	1	9/20/2019 10:17
Methylene chloride	U		0.86	5.0	µg/L	1	9/20/2019 10:17
Naphthalene	U		0.77	5.0	µg/L	1	9/20/2019 10:17
n-Butylbenzene	U		0.34	1.0	µg/L	1	9/20/2019 10:17
n-Propylbenzene	U		0.48	1.0	µg/L	1	9/20/2019 10:17
o-Xylene	U		0.31	1.0	µg/L	1	9/20/2019 10:17
p-Isopropyltoluene	U		0.26	1.0	µg/L	1	9/20/2019 10:17
sec-Butylbenzene	U		0.30	1.0	µg/L	1	9/20/2019 10:17
Styrene	U		0.33	1.0	µg/L	1	9/20/2019 10:17
tert-Butyl alcohol	**5.0**	J	**2.4**	**20**	**µg/L**	1	9/20/2019 10:17
tert-Butylbenzene	U		0.39	1.0	µg/L	1	9/20/2019 10:17
Tetrachloroethene	U		0.39	1.0	µg/L	1	9/20/2019 10:17
Tetrahydrofuran	U		0.73	1.0	µg/L	1	9/20/2019 10:17
Toluene	U		0.45	1.0	µg/L	1	9/20/2019 10:17
trans-1,2-Dichloroethene	U		0.48	1.0	µg/L	1	9/20/2019 10:17
trans-1,3-Dichloropropene	U		0.38	1.0	µg/L	1	9/20/2019 10:17
trans-1,4-Dichloro-2-butene	U		0.58	2.0	µg/L	1	9/20/2019 10:17
Trichloroethene	U		0.43	1.0	µg/L	1	9/20/2019 10:17
Trichlorofluoromethane	U		0.52	1.0	µg/L	1	9/20/2019 10:17

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *25-Sep-19*

Client: BB&E, Inc.
Project: SSW Collis 2019 LTM Task 3
Sample ID: COL-GW-11
Collection Date: 9/9/2019 04:30 PM

Work Order: 19090657
Lab ID: 19090657-11
Matrix: GROUNDWATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Vinyl acetate	U		0.83	5.0	µg/L	1	9/20/2019 10:17
Vinyl chloride	**43**		**0.53**	**1.0**	**µg/L**	1	9/20/2019 10:17
Surr: 1,2-Dichloroethane-d4	*98.4*			*75-120*	*%REC*	1	9/20/2019 10:17
Surr: 4-Bromofluorobenzene	*95.4*			*80-110*	*%REC*	1	9/20/2019 10:17
Surr: Dibromofluoromethane	*97.2*			*85-115*	*%REC*	1	9/20/2019 10:17
Surr: Toluene-d8	*98.8*			*85-110*	*%REC*	1	9/20/2019 10:17

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *25-Sep-19*

Client: BB&E, Inc.
Project: SSW Collis 2019 LTM Task 3
Sample ID: COL-GW-12
Collection Date: 9/10/2019 08:15 AM

Work Order: 19090657
Lab ID: 19090657-12
Matrix: GROUNDWATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
GASES IN WATER			Method: **RSK-175**				Analyst: **KB**
Ethane	**10**		**1.5**	**5.0**	**µg/L**	1	9/23/2019 14:43
Ethene	U		2.7	5.0	µg/L	1	9/23/2019 14:43
Methane	**240**		**16**	**25**	**µg/L**	5	9/23/2019 14:45
METALS BY ICP-MS (DISSOLVED)			Method: **SW6020A**		Prep: FILTER / 9/20/19		Analyst: **STP**
Iron	**0.17**		**0.050**	**0.080**	**mg/L**	1	9/20/2019 16:45
Manganese	**0.31**		**0.0025**	**0.0050**	**mg/L**	1	9/20/2019 16:45
1,4-DIOXANE BY SELECT ION MONITORING			Method: **SW8260B**				Analyst: **AK**
1,4-Dioxane	U		0.44	0.60	µg/L	1	9/18/2019 12:33
Surr: Toluene-d8	*108*			*74-124*	*%REC*	1	9/18/2019 12:33
VOLATILE ORGANIC COMPOUNDS			Method: **SW8260C**				Analyst: **BG**
1,1,1,2-Tetrachloroethane	U		0.38	1.0	µg/L	1	9/20/2019 22:19
1,1,1-Trichloroethane	U		0.46	1.0	µg/L	1	9/20/2019 22:19
1,1,2,2-Tetrachloroethane	U		0.40	1.0	µg/L	1	9/20/2019 22:19
1,1,2-Trichloroethane	**0.59**	J	**0.46**	**1.0**	**µg/L**	1	9/20/2019 22:19
1,1,2-Trichlorotrifluoroethane	U		0.52	1.0	µg/L	1	9/20/2019 22:19
1,1-Dichloroethane	U		0.44	1.0	µg/L	1	9/20/2019 22:19
1,1-Dichloroethene	**3.6**		**0.40**	**1.0**	**µg/L**	1	9/20/2019 22:19
1,1-Dichloropropene	U		0.37	1.0	µg/L	1	9/20/2019 22:19
1,2,3-Trichlorobenzene	U		0.42	1.0	µg/L	1	9/20/2019 22:19
1,2,3-Trichloropropane	U		0.40	1.0	µg/L	1	9/20/2019 22:19
1,2,4-Trichlorobenzene	U		0.45	1.0	µg/L	1	9/20/2019 22:19
1,2,4-Trimethylbenzene	U		0.45	1.0	µg/L	1	9/20/2019 22:19
1,2-Dibromo-3-chloropropane	U		0.43	1.0	µg/L	1	9/20/2019 22:19
1,2-Dibromoethane	U		0.41	1.0	µg/L	1	9/20/2019 22:19
1,2-Dichlorobenzene	U		0.32	1.0	µg/L	1	9/20/2019 22:19
1,2-Dichloroethane	U		0.44	1.0	µg/L	1	9/20/2019 22:19
1,2-Dichloropropane	**0.67**	J	**0.48**	**1.0**	**µg/L**	1	9/20/2019 22:19
1,3,5-Trichlorobenzene	U		0.31	1.0	µg/L	1	9/20/2019 22:19
1,3,5-Trimethylbenzene	U		0.65	1.0	µg/L	1	9/20/2019 22:19
1,3-Dichlorobenzene	U		0.33	1.0	µg/L	1	9/20/2019 22:19
1,3-Dichloropropane	U		0.40	1.0	µg/L	1	9/20/2019 22:19
1,4-Dichlorobenzene	U		0.35	1.0	µg/L	1	9/20/2019 22:19
2,2-Dichloropropane	U		0.52	1.0	µg/L	1	9/20/2019 22:19
2-Butanone	U		0.52	5.0	µg/L	1	9/20/2019 22:19
2-Chloroethyl vinyl ether	U		0.82	1.0	µg/L	1	9/20/2019 22:19
2-Chlorotoluene	U		0.36	1.0	µg/L	1	9/20/2019 22:19
2-Hexanone	U		0.59	5.0	µg/L	1	9/20/2019 22:19

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: BB&E, Inc.
Project: SSW Collis 2019 LTM Task 3
Sample ID: COL-GW-12
Collection Date: 9/10/2019 08:15 AM

Work Order: 19090657
Lab ID: 19090657-12
Matrix: GROUNDWATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
2-Methylnaphthalene	U		0.66	5.0	µg/L	1	9/20/2019 22:19
4-Chlorotoluene	U		0.31	1.0	µg/L	1	9/20/2019 22:19
4-Isopropyltoluene	U		0.10	1.0	µg/L	1	9/20/2019 22:19
4-Methyl-2-pentanone	U		0.52	1.0	µg/L	1	9/20/2019 22:19
Acetone	**16**		**1.1**	**10**	**µg/L**	1	9/20/2019 22:19
Acrolein	U		0.38	1.0	µg/L	1	9/20/2019 22:19
Acrylonitrile	U		0.50	1.0	µg/L	1	9/20/2019 22:19
Benzene	U		0.46	1.0	µg/L	1	9/20/2019 22:19
Benzyl chloride	U		0.34	1.0	µg/L	1	9/20/2019 22:19
Bromobenzene	U		0.38	1.0	µg/L	1	9/20/2019 22:19
Bromochloromethane	U		0.45	1.0	µg/L	1	9/20/2019 22:19
Bromodichloromethane	U		0.49	1.0	µg/L	1	9/20/2019 22:19
Bromoform	U		0.56	1.0	µg/L	1	9/20/2019 22:19
Bromomethane	U		0.90	1.0	µg/L	1	9/20/2019 22:19
Carbon disulfide	U		0.49	1.0	µg/L	1	9/20/2019 22:19
Carbon tetrachloride	U		0.40	1.0	µg/L	1	9/20/2019 22:19
Chlorobenzene	U		0.40	1.0	µg/L	1	9/20/2019 22:19
Chloroethane	U		0.68	1.0	µg/L	1	9/20/2019 22:19
Chloroform	U		0.46	1.0	µg/L	1	9/20/2019 22:19
Chloromethane	U		0.83	1.0	µg/L	1	9/20/2019 22:19
cis-1,2-Dichloroethene	**260**		**2.1**	**5.0**	**µg/L**	5	9/20/2019 02:43
cis-1,3-Dichloropropene	U		0.57	1.0	µg/L	1	9/20/2019 22:19
Dibromochloromethane	U		0.40	1.0	µg/L	1	9/20/2019 22:19
Dibromomethane	U		0.65	1.0	µg/L	1	9/20/2019 22:19
Dichlorodifluoromethane	U		0.68	1.0	µg/L	1	9/20/2019 22:19
Ethylbenzene	U		0.34	1.0	µg/L	1	9/20/2019 22:19
Hexachlorobutadiene	U		0.56	1.0	µg/L	1	9/20/2019 22:19
Hexachloroethane	U		0.45	1.0	µg/L	1	9/20/2019 22:19
Hexane	U		0.40	1.0	µg/L	1	9/20/2019 22:19
Iodomethane	U		2.0	5.0	µg/L	1	9/20/2019 22:19
Isopropylbenzene	U		0.35	1.0	µg/L	1	9/20/2019 22:19
m,p-Xylene	U		0.81	2.0	µg/L	1	9/20/2019 22:19
Methyl tert-butyl ether	U		0.45	1.0	µg/L	1	9/20/2019 22:19
Methylene chloride	U		0.86	5.0	µg/L	1	9/20/2019 22:19
Naphthalene	U		0.77	5.0	µg/L	1	9/20/2019 22:19
n-Butylbenzene	U		0.34	1.0	µg/L	1	9/20/2019 22:19
n-Propylbenzene	U		0.48	1.0	µg/L	1	9/20/2019 22:19
o-Xylene	U		0.31	1.0	µg/L	1	9/20/2019 22:19
p-Isopropyltoluene	U		0.26	1.0	µg/L	1	9/20/2019 22:19
sec-Butylbenzene	U		0.30	1.0	µg/L	1	9/20/2019 22:19

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *25-Sep-19*

Client: BB&E, Inc.
Project: SSW Collis 2019 LTM Task 3
Sample ID: COL-GW-12
Collection Date: 9/10/2019 08:15 AM

Work Order: 19090657
Lab ID: 19090657-12
Matrix: GROUNDWATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Styrene	U		0.33	1.0	µg/L	1	9/20/2019 22:19
tert-Butyl alcohol	U		2.4	20	µg/L	1	9/20/2019 22:19
tert-Butylbenzene	U		0.39	1.0	µg/L	1	9/20/2019 22:19
Tetrachloroethene	U		0.39	1.0	µg/L	1	9/20/2019 22:19
Tetrahydrofuran	U		0.73	1.0	µg/L	1	9/20/2019 22:19
Toluene	U		0.45	1.0	µg/L	1	9/20/2019 22:19
trans-1,2-Dichloroethene	**9.8**		**0.48**	**1.0**	**µg/L**	1	9/20/2019 22:19
trans-1,3-Dichloropropene	U		0.38	1.0	µg/L	1	9/20/2019 22:19
trans-1,4-Dichloro-2-butene	U		0.58	2.0	µg/L	1	9/20/2019 22:19
Trichloroethene	**220**		**2.2**	**5.0**	**µg/L**	5	9/20/2019 02:43
Trichlorofluoromethane	U		0.52	1.0	µg/L	1	9/20/2019 22:19
Vinyl acetate	U		0.83	5.0	µg/L	1	9/20/2019 22:19
Vinyl chloride	**39**		**0.53**	**1.0**	**µg/L**	1	9/20/2019 22:19
Surr: 1,2-Dichloroethane-d4	*99.2*			*75-120*	*%REC*	5	9/20/2019 02:43
Surr: 1,2-Dichloroethane-d4	*99.3*			*75-120*	*%REC*	1	9/20/2019 22:19
Surr: 4-Bromofluorobenzene	*96.1*			*80-110*	*%REC*	5	9/20/2019 02:43
Surr: 4-Bromofluorobenzene	*93.6*			*80-110*	*%REC*	1	9/20/2019 22:19
Surr: Dibromofluoromethane	*93.5*			*85-115*	*%REC*	5	9/20/2019 02:43
Surr: Dibromofluoromethane	*96.2*			*85-115*	*%REC*	1	9/20/2019 22:19
Surr: Toluene-d8	*102*			*85-110*	*%REC*	5	9/20/2019 02:43
Surr: Toluene-d8	*98.0*			*85-110*	*%REC*	1	9/20/2019 22:19
ANIONS BY ION CHROMATOGRAPHY		Method: **SW9056A**					Analyst: **JDR**
Chloride	**67**		**3.1**	**10**	**mg/L**	10	9/12/2019 14:50
Sulfate	**99**		**3.4**	**10**	**mg/L**	10	9/12/2019 14:50
NITROGEN, NITRATE-NITRITE		Method: **E353.2 R2.0**					Analyst: **JZB**
Nitrogen, Nitrate-Nitrite	U		0.012	0.020	mg/L	1	9/17/2019 11:06
SULFIDE		Method: **SW9034**					Analyst: **DNW**
Sulfide	U		0.42	1.0	mg/L	1	9/12/2019 14:00

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *25-Sep-19*

Client: BB&E, Inc.
Project: SSW Collis 2019 LTM Task 3
Sample ID: COL-GW-13
Collection Date: 9/10/2019 09:00 AM

Work Order: 19090657
Lab ID: 19090657-13
Matrix: GROUNDWATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
GASES IN WATER			Method: **RSK-175**				Analyst: **KB**
Ethane	**12**		**1.5**	**5.0**	**µg/L**	1	9/23/2019 14:48
Ethene	U		2.7	5.0	µg/L	1	9/23/2019 14:48
Methane	**170**		**3.3**	**5.0**	**µg/L**	1	9/23/2019 14:48
METALS BY ICP-MS (DISSOLVED)			Method: **SW6020A**		Prep: FILTER / 9/20/19		Analyst: **STP**
Iron	U		0.050	0.080	mg/L	1	9/20/2019 16:47
Manganese	**0.35**		**0.0025**	**0.0050**	**mg/L**	1	9/20/2019 16:47
1,4-DIOXANE BY SELECT ION MONITORING			Method: **SW8260B**				Analyst: **AK**
1,4-Dioxane	U		0.44	0.60	µg/L	1	9/18/2019 12:48
Surr: Toluene-d8	*102*			*74-124*	*%REC*	1	9/18/2019 12:48
VOLATILE ORGANIC COMPOUNDS			Method: **SW8260C**				Analyst: **BG**
1,1,1,2-Tetrachloroethane	U		0.38	1.0	µg/L	1	9/20/2019 21:55
1,1,1-Trichloroethane	U		0.46	1.0	µg/L	1	9/20/2019 21:55
1,1,2,2-Tetrachloroethane	U		0.40	1.0	µg/L	1	9/20/2019 21:55
1,1,2-Trichloroethane	U		0.46	1.0	µg/L	1	9/20/2019 21:55
1,1,2-Trichlorotrifluoroethane	U		0.52	1.0	µg/L	1	9/20/2019 21:55
1,1-Dichloroethane	U		0.44	1.0	µg/L	1	9/20/2019 21:55
1,1-Dichloroethene	**0.84**	J	**0.40**	**1.0**	**µg/L**	1	9/20/2019 21:55
1,1-Dichloropropene	U		0.37	1.0	µg/L	1	9/20/2019 21:55
1,2,3-Trichlorobenzene	U		0.42	1.0	µg/L	1	9/20/2019 21:55
1,2,3-Trichloropropane	U		0.40	1.0	µg/L	1	9/20/2019 21:55
1,2,4-Trichlorobenzene	U		0.45	1.0	µg/L	1	9/20/2019 21:55
1,2,4-Trimethylbenzene	U		0.45	1.0	µg/L	1	9/20/2019 21:55
1,2-Dibromo-3-chloropropane	U		0.43	1.0	µg/L	1	9/20/2019 21:55
1,2-Dibromoethane	U		0.41	1.0	µg/L	1	9/20/2019 21:55
1,2-Dichlorobenzene	U		0.32	1.0	µg/L	1	9/20/2019 21:55
1,2-Dichloroethane	U		0.44	1.0	µg/L	1	9/20/2019 21:55
1,2-Dichloropropane	U		0.48	1.0	µg/L	1	9/20/2019 21:55
1,3,5-Trichlorobenzene	U		0.31	1.0	µg/L	1	9/20/2019 21:55
1,3,5-Trimethylbenzene	U		0.65	1.0	µg/L	1	9/20/2019 21:55
1,3-Dichlorobenzene	U		0.33	1.0	µg/L	1	9/20/2019 21:55
1,3-Dichloropropane	U		0.40	1.0	µg/L	1	9/20/2019 21:55
1,4-Dichlorobenzene	U		0.35	1.0	µg/L	1	9/20/2019 21:55
2,2-Dichloropropane	U		0.52	1.0	µg/L	1	9/20/2019 21:55
2-Butanone	U		0.52	5.0	µg/L	1	9/20/2019 21:55
2-Chloroethyl vinyl ether	U		0.82	1.0	µg/L	1	9/20/2019 21:55
2-Chlorotoluene	U		0.36	1.0	µg/L	1	9/20/2019 21:55
2-Hexanone	U		0.59	5.0	µg/L	1	9/20/2019 21:55

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *25-Sep-19*

Client: BB&E, Inc.
Project: SSW Collis 2019 LTM Task 3
Sample ID: COL-GW-13
Collection Date: 9/10/2019 09:00 AM

Work Order: 19090657
Lab ID: 19090657-13
Matrix: GROUNDWATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
2-Methylnaphthalene	U		0.66	5.0	µg/L	1	9/20/2019 21:55
4-Chlorotoluene	U		0.31	1.0	µg/L	1	9/20/2019 21:55
4-Isopropyltoluene	U		0.10	1.0	µg/L	1	9/20/2019 21:55
4-Methyl-2-pentanone	U		0.52	1.0	µg/L	1	9/20/2019 21:55
Acetone	**8.9**	J	**1.1**	**10**	**µg/L**	1	9/20/2019 21:55
Acrolein	U		0.38	1.0	µg/L	1	9/20/2019 21:55
Acrylonitrile	U		0.50	1.0	µg/L	1	9/20/2019 21:55
Benzene	U		0.46	1.0	µg/L	1	9/20/2019 21:55
Benzyl chloride	U		0.34	1.0	µg/L	1	9/20/2019 21:55
Bromobenzene	U		0.38	1.0	µg/L	1	9/20/2019 21:55
Bromochloromethane	U		0.45	1.0	µg/L	1	9/20/2019 21:55
Bromodichloromethane	U		0.49	1.0	µg/L	1	9/20/2019 21:55
Bromoform	U		0.56	1.0	µg/L	1	9/20/2019 21:55
Bromomethane	U		0.90	1.0	µg/L	1	9/20/2019 21:55
Carbon disulfide	U		0.49	1.0	µg/L	1	9/20/2019 21:55
Carbon tetrachloride	U		0.40	1.0	µg/L	1	9/20/2019 21:55
Chlorobenzene	U		0.40	1.0	µg/L	1	9/20/2019 21:55
Chloroethane	U		0.68	1.0	µg/L	1	9/20/2019 21:55
Chloroform	U		0.46	1.0	µg/L	1	9/20/2019 21:55
Chloromethane	**1.0**		**0.83**	**1.0**	**µg/L**	1	9/20/2019 21:55
cis-1,2-Dichloroethene	**120**		**2.1**	**5.0**	**µg/L**	5	9/20/2019 03:07
cis-1,3-Dichloropropene	U		0.57	1.0	µg/L	1	9/20/2019 21:55
Dibromochloromethane	U		0.40	1.0	µg/L	1	9/20/2019 21:55
Dibromomethane	U		0.65	1.0	µg/L	1	9/20/2019 21:55
Dichlorodifluoromethane	U		0.68	1.0	µg/L	1	9/20/2019 21:55
Ethylbenzene	U		0.34	1.0	µg/L	1	9/20/2019 21:55
Hexachlorobutadiene	U		0.56	1.0	µg/L	1	9/20/2019 21:55
Hexachloroethane	U		0.45	1.0	µg/L	1	9/20/2019 21:55
Hexane	U		0.40	1.0	µg/L	1	9/20/2019 21:55
Iodomethane	U		2.0	5.0	µg/L	1	9/20/2019 21:55
Isopropylbenzene	U		0.35	1.0	µg/L	1	9/20/2019 21:55
m,p-Xylene	U		0.81	2.0	µg/L	1	9/20/2019 21:55
Methyl tert-butyl ether	U		0.45	1.0	µg/L	1	9/20/2019 21:55
Methylene chloride	U		0.86	5.0	µg/L	1	9/20/2019 21:55
Naphthalene	U		0.77	5.0	µg/L	1	9/20/2019 21:55
n-Butylbenzene	U		0.34	1.0	µg/L	1	9/20/2019 21:55
n-Propylbenzene	U		0.48	1.0	µg/L	1	9/20/2019 21:55
o-Xylene	U		0.31	1.0	µg/L	1	9/20/2019 21:55
p-Isopropyltoluene	U		0.26	1.0	µg/L	1	9/20/2019 21:55
sec-Butylbenzene	U		0.30	1.0	µg/L	1	9/20/2019 21:55

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: BB&E, Inc.
Project: SSW Collis 2019 LTM Task 3
Sample ID: COL-GW-13
Collection Date: 9/10/2019 09:00 AM

Work Order: 19090657
Lab ID: 19090657-13
Matrix: GROUNDWATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Styrene	U		0.33	1.0	µg/L	1	9/20/2019 21:55
tert-Butyl alcohol	U		2.4	20	µg/L	1	9/20/2019 21:55
tert-Butylbenzene	U		0.39	1.0	µg/L	1	9/20/2019 21:55
Tetrachloroethene	U		0.39	1.0	µg/L	1	9/20/2019 21:55
Tetrahydrofuran	U		0.73	1.0	µg/L	1	9/20/2019 21:55
Toluene	U		0.45	1.0	µg/L	1	9/20/2019 21:55
trans-1,2-Dichloroethene	**3.1**		**0.48**	**1.0**	**µg/L**	1	9/20/2019 21:55
trans-1,3-Dichloropropene	U		0.38	1.0	µg/L	1	9/20/2019 21:55
trans-1,4-Dichloro-2-butene	U		0.58	2.0	µg/L	1	9/20/2019 21:55
Trichloroethene	**13**		**0.43**	**1.0**	**µg/L**	1	9/20/2019 21:55
Trichlorofluoromethane	U		0.52	1.0	µg/L	1	9/20/2019 21:55
Vinyl acetate	U		0.83	5.0	µg/L	1	9/20/2019 21:55
Vinyl chloride	**2.7**		**0.53**	**1.0**	**µg/L**	1	9/20/2019 21:55
Surr: 1,2-Dichloroethane-d4	*102*			*75-120*	*%REC*	5	9/20/2019 03:07
Surr: 1,2-Dichloroethane-d4	*98.0*			*75-120*	*%REC*	1	9/20/2019 21:55
Surr: 4-Bromofluorobenzene	*95.0*			*80-110*	*%REC*	5	9/20/2019 03:07
Surr: 4-Bromofluorobenzene	*95.2*			*80-110*	*%REC*	1	9/20/2019 21:55
Surr: Dibromofluoromethane	*98.6*			*85-115*	*%REC*	5	9/20/2019 03:07
Surr: Dibromofluoromethane	*94.8*			*85-115*	*%REC*	1	9/20/2019 21:55
Surr: Toluene-d8	*99.0*			*85-110*	*%REC*	5	9/20/2019 03:07
Surr: Toluene-d8	*97.5*			*85-110*	*%REC*	1	9/20/2019 21:55
ANIONS BY ION CHROMATOGRAPHY		Method: **SW9056A**					Analyst: **JDR**
Chloride	**59**		**3.1**	**10**	**mg/L**	10	9/12/2019 16:07
Sulfate	**55**		**3.4**	**10**	**mg/L**	10	9/12/2019 16:07
NITROGEN, NITRATE-NITRITE		Method: **E353.2 R2.0**					Analyst: **JZB**
Nitrogen, Nitrate-Nitrite	U		0.012	0.020	mg/L	1	9/17/2019 11:07
SULFIDE		Method: **SW9034**					Analyst: **DNW**
Sulfide	U		0.42	1.0	mg/L	1	9/12/2019 14:00

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *25-Sep-19*

Client: BB&E, Inc.
Project: SSW Collis 2019 LTM Task 3
Sample ID: COL-GW-14
Collection Date: 9/10/2019 09:45 AM

Work Order: 19090657
Lab ID: 19090657-14
Matrix: GROUNDWATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
VOLATILE ORGANIC COMPOUNDS		Method: **SW8260C**					Analyst: **BG**
1,1,1,2-Tetrachloroethane	U		0.38	1.0	µg/L	1	9/20/2019 03:32
1,1,1-Trichloroethane	U		0.46	1.0	µg/L	1	9/20/2019 03:32
1,1,2,2-Tetrachloroethane	U		0.40	1.0	µg/L	1	9/20/2019 03:32
1,1,2-Trichloroethane	U		0.46	1.0	µg/L	1	9/20/2019 03:32
1,1,2-Trichlorotrifluoroethane	U		0.52	1.0	µg/L	1	9/20/2019 03:32
1,1-Dichloroethane	U		0.44	1.0	µg/L	1	9/20/2019 03:32
1,1-Dichloroethene	**1.5**		**0.40**	**1.0**	**µg/L**	1	9/20/2019 03:32
1,1-Dichloropropene	U		0.37	1.0	µg/L	1	9/20/2019 03:32
1,2,3-Trichlorobenzene	U		0.42	1.0	µg/L	1	9/20/2019 03:32
1,2,3-Trichloropropane	U		0.40	1.0	µg/L	1	9/20/2019 03:32
1,2,4-Trichlorobenzene	U		0.45	1.0	µg/L	1	9/20/2019 03:32
1,2,4-Trimethylbenzene	U		0.45	1.0	µg/L	1	9/20/2019 03:32
1,2-Dibromo-3-chloropropane	U		0.43	1.0	µg/L	1	9/20/2019 03:32
1,2-Dibromoethane	U		0.41	1.0	µg/L	1	9/20/2019 03:32
1,2-Dichlorobenzene	U		0.32	1.0	µg/L	1	9/20/2019 03:32
1,2-Dichloroethane	U		0.44	1.0	µg/L	1	9/20/2019 03:32
1,2-Dichloropropane	U		0.48	1.0	µg/L	1	9/20/2019 03:32
1,3,5-Trichlorobenzene	U		0.31	1.0	µg/L	1	9/20/2019 03:32
1,3,5-Trimethylbenzene	U		0.65	1.0	µg/L	1	9/20/2019 03:32
1,3-Dichlorobenzene	U		0.33	1.0	µg/L	1	9/20/2019 03:32
1,3-Dichloropropane	U		0.40	1.0	µg/L	1	9/20/2019 03:32
1,4-Dichlorobenzene	U		0.35	1.0	µg/L	1	9/20/2019 03:32
2,2-Dichloropropane	U		0.52	1.0	µg/L	1	9/20/2019 03:32
2-Butanone	U		0.52	5.0	µg/L	1	9/20/2019 03:32
2-Chloroethyl vinyl ether	U		0.82	1.0	µg/L	1	9/20/2019 03:32
2-Chlorotoluene	U		0.36	1.0	µg/L	1	9/20/2019 03:32
2-Hexanone	U		0.59	5.0	µg/L	1	9/20/2019 03:32
2-Methylnaphthalene	U		0.66	5.0	µg/L	1	9/20/2019 03:32
4-Chlorotoluene	U		0.31	1.0	µg/L	1	9/20/2019 03:32
4-Isopropyltoluene	U		0.10	1.0	µg/L	1	9/20/2019 03:32
4-Methyl-2-pentanone	U		0.52	1.0	µg/L	1	9/20/2019 03:32
Acetone	**6.3**	J	**1.1**	**10**	**µg/L**	1	9/20/2019 03:32
Acrolein	U		0.38	1.0	µg/L	1	9/20/2019 03:32
Acrylonitrile	U		0.50	1.0	µg/L	1	9/20/2019 03:32
Benzene	U		0.46	1.0	µg/L	1	9/20/2019 03:32
Benzyl chloride	U		0.34	1.0	µg/L	1	9/20/2019 03:32
Bromobenzene	U		0.38	1.0	µg/L	1	9/20/2019 03:32
Bromochloromethane	U		0.45	1.0	µg/L	1	9/20/2019 03:32

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *25-Sep-19*

Client: BB&E, Inc.
Project: SSW Collis 2019 LTM Task 3
Sample ID: COL-GW-14
Collection Date: 9/10/2019 09:45 AM

Work Order: 19090657
Lab ID: 19090657-14
Matrix: GROUNDWATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Bromodichloromethane	U		0.49	1.0	µg/L	1	9/20/2019 03:32
Bromoform	U		0.56	1.0	µg/L	1	9/20/2019 03:32
Bromomethane	U		0.90	1.0	µg/L	1	9/20/2019 03:32
Carbon disulfide	U		0.49	1.0	µg/L	1	9/20/2019 03:32
Carbon tetrachloride	U		0.40	1.0	µg/L	1	9/20/2019 03:32
Chlorobenzene	U		0.40	1.0	µg/L	1	9/20/2019 03:32
Chloroethane	U		0.68	1.0	µg/L	1	9/20/2019 03:32
Chloroform	U		0.46	1.0	µg/L	1	9/20/2019 03:32
Chloromethane	U		0.83	1.0	µg/L	1	9/20/2019 03:32
cis-1,2-Dichloroethene	**230**		**2.1**	**5.0**	**µg/L**	5	9/20/2019 18:35
cis-1,3-Dichloropropene	U		0.57	1.0	µg/L	1	9/20/2019 03:32
Dibromochloromethane	U		0.40	1.0	µg/L	1	9/20/2019 03:32
Dibromomethane	U		0.65	1.0	µg/L	1	9/20/2019 03:32
Dichlorodifluoromethane	U		0.68	1.0	µg/L	1	9/20/2019 03:32
Ethylbenzene	U		0.34	1.0	µg/L	1	9/20/2019 03:32
Hexachlorobutadiene	U		0.56	1.0	µg/L	1	9/20/2019 03:32
Hexachloroethane	U		0.45	1.0	µg/L	1	9/20/2019 03:32
Hexane	U		0.40	1.0	µg/L	1	9/20/2019 03:32
Iodomethane	U		2.0	5.0	µg/L	1	9/20/2019 03:32
Isopropylbenzene	U		0.35	1.0	µg/L	1	9/20/2019 03:32
m,p-Xylene	U		0.81	2.0	µg/L	1	9/20/2019 03:32
Methyl tert-butyl ether	U		0.45	1.0	µg/L	1	9/20/2019 03:32
Methylene chloride	U		0.86	5.0	µg/L	1	9/20/2019 03:32
Naphthalene	U		0.77	5.0	µg/L	1	9/20/2019 03:32
n-Butylbenzene	U		0.34	1.0	µg/L	1	9/20/2019 03:32
n-Propylbenzene	U		0.48	1.0	µg/L	1	9/20/2019 03:32
o-Xylene	U		0.31	1.0	µg/L	1	9/20/2019 03:32
p-Isopropyltoluene	U		0.26	1.0	µg/L	1	9/20/2019 03:32
sec-Butylbenzene	U		0.30	1.0	µg/L	1	9/20/2019 03:32
Styrene	U		0.33	1.0	µg/L	1	9/20/2019 03:32
tert-Butyl alcohol	U		2.4	20	µg/L	1	9/20/2019 03:32
tert-Butylbenzene	U		0.39	1.0	µg/L	1	9/20/2019 03:32
Tetrachloroethene	U		0.39	1.0	µg/L	1	9/20/2019 03:32
Tetrahydrofuran	U		0.73	1.0	µg/L	1	9/20/2019 03:32
Toluene	U		0.45	1.0	µg/L	1	9/20/2019 03:32
trans-1,2-Dichloroethene	**11**		**0.48**	**1.0**	**µg/L**	1	9/20/2019 03:32
trans-1,3-Dichloropropene	U		0.38	1.0	µg/L	1	9/20/2019 03:32
trans-1,4-Dichloro-2-butene	U		0.58	2.0	µg/L	1	9/20/2019 03:32
Trichloroethene	U		0.43	1.0	µg/L	1	9/20/2019 03:32
Trichlorofluoromethane	U		0.52	1.0	µg/L	1	9/20/2019 03:32

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *25-Sep-19*

Client: BB&E, Inc.
Project: SSW Collis 2019 LTM Task 3
Sample ID: COL-GW-14
Collection Date: 9/10/2019 09:45 AM

Work Order: 19090657
Lab ID: 19090657-14
Matrix: GROUNDWATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Vinyl acetate	U		0.83	5.0	µg/L	1	9/20/2019 03:32
Vinyl chloride	**110**		**2.6**	**5.0**	**µg/L**	5	9/20/2019 18:35
Surr: 1,2-Dichloroethane-d4	*98.8*			*75-120*	*%REC*	1	9/20/2019 03:32
Surr: 1,2-Dichloroethane-d4	*98.0*			*75-120*	*%REC*	5	9/20/2019 18:35
Surr: 4-Bromofluorobenzene	*94.6*			*80-110*	*%REC*	1	9/20/2019 03:32
Surr: 4-Bromofluorobenzene	*96.2*			*80-110*	*%REC*	5	9/20/2019 18:35
Surr: Dibromofluoromethane	*97.4*			*85-115*	*%REC*	1	9/20/2019 03:32
Surr: Dibromofluoromethane	*97.2*			*85-115*	*%REC*	5	9/20/2019 18:35
Surr: Toluene-d8	*99.5*			*85-110*	*%REC*	1	9/20/2019 03:32
Surr: Toluene-d8	*97.2*			*85-110*	*%REC*	5	9/20/2019 18:35

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *25-Sep-19*

Client: BB&E, Inc.
Project: SSW Collis 2019 LTM Task 3
Sample ID: COL-GW-15
Collection Date: 9/10/2019 09:45 AM

Work Order: 19090657
Lab ID: 19090657-15
Matrix: GROUNDWATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
VOLATILE ORGANIC COMPOUNDS		Method: **SW8260C**					Analyst: **BG**
1,1,1,2-Tetrachloroethane	U		0.38	1.0	µg/L	1	9/20/2019 22:44
1,1,1-Trichloroethane	U		0.46	1.0	µg/L	1	9/20/2019 22:44
1,1,2,2-Tetrachloroethane	U		0.40	1.0	µg/L	1	9/20/2019 22:44
1,1,2-Trichloroethane	U		0.46	1.0	µg/L	1	9/20/2019 22:44
1,1,2-Trichlorotrifluoroethane	U		0.52	1.0	µg/L	1	9/20/2019 22:44
1,1-Dichloroethane	U		0.44	1.0	µg/L	1	9/20/2019 22:44
1,1-Dichloroethene	**1.6**		**0.40**	**1.0**	**µg/L**	1	9/20/2019 22:44
1,1-Dichloropropene	U		0.37	1.0	µg/L	1	9/20/2019 22:44
1,2,3-Trichlorobenzene	U		0.42	1.0	µg/L	1	9/20/2019 22:44
1,2,3-Trichloropropane	U		0.40	1.0	µg/L	1	9/20/2019 22:44
1,2,4-Trichlorobenzene	U		0.45	1.0	µg/L	1	9/20/2019 22:44
1,2,4-Trimethylbenzene	U		0.45	1.0	µg/L	1	9/20/2019 22:44
1,2-Dibromo-3-chloropropane	U		0.43	1.0	µg/L	1	9/20/2019 22:44
1,2-Dibromoethane	U		0.41	1.0	µg/L	1	9/20/2019 22:44
1,2-Dichlorobenzene	U		0.32	1.0	µg/L	1	9/20/2019 22:44
1,2-Dichloroethane	U		0.44	1.0	µg/L	1	9/20/2019 22:44
1,2-Dichloropropane	U		0.48	1.0	µg/L	1	9/20/2019 22:44
1,3,5-Trichlorobenzene	U		0.31	1.0	µg/L	1	9/20/2019 22:44
1,3,5-Trimethylbenzene	U		0.65	1.0	µg/L	1	9/20/2019 22:44
1,3-Dichlorobenzene	U		0.33	1.0	µg/L	1	9/20/2019 22:44
1,3-Dichloropropane	U		0.40	1.0	µg/L	1	9/20/2019 22:44
1,4-Dichlorobenzene	U		0.35	1.0	µg/L	1	9/20/2019 22:44
2,2-Dichloropropane	U		0.52	1.0	µg/L	1	9/20/2019 22:44
2-Butanone	U		0.52	5.0	µg/L	1	9/20/2019 22:44
2-Chloroethyl vinyl ether	U		0.82	1.0	µg/L	1	9/20/2019 22:44
2-Chlorotoluene	U		0.36	1.0	µg/L	1	9/20/2019 22:44
2-Hexanone	U		0.59	5.0	µg/L	1	9/20/2019 22:44
2-Methylnaphthalene	U		0.66	5.0	µg/L	1	9/20/2019 22:44
4-Chlorotoluene	U		0.31	1.0	µg/L	1	9/20/2019 22:44
4-Isopropyltoluene	U		0.10	1.0	µg/L	1	9/20/2019 22:44
4-Methyl-2-pentanone	U		0.52	1.0	µg/L	1	9/20/2019 22:44
Acetone	**4.6**	J	**1.1**	**10**	**µg/L**	1	9/20/2019 22:44
Acrolein	U		0.38	1.0	µg/L	1	9/20/2019 22:44
Acrylonitrile	U		0.50	1.0	µg/L	1	9/20/2019 22:44
Benzene	U		0.46	1.0	µg/L	1	9/20/2019 22:44
Benzyl chloride	U		0.34	1.0	µg/L	1	9/20/2019 22:44
Bromobenzene	U		0.38	1.0	µg/L	1	9/20/2019 22:44
Bromochloromethane	U		0.45	1.0	µg/L	1	9/20/2019 22:44

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *25-Sep-19*

Client: BB&E, Inc.
Project: SSW Collis 2019 LTM Task 3
Sample ID: COL-GW-15
Collection Date: 9/10/2019 09:45 AM

Work Order: 19090657
Lab ID: 19090657-15
Matrix: GROUNDWATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Bromodichloromethane	U		0.49	1.0	µg/L	1	9/20/2019 22:44
Bromoform	U		0.56	1.0	µg/L	1	9/20/2019 22:44
Bromomethane	U		0.90	1.0	µg/L	1	9/20/2019 22:44
Carbon disulfide	U		0.49	1.0	µg/L	1	9/20/2019 22:44
Carbon tetrachloride	U		0.40	1.0	µg/L	1	9/20/2019 22:44
Chlorobenzene	U		0.40	1.0	µg/L	1	9/20/2019 22:44
Chloroethane	U		0.68	1.0	µg/L	1	9/20/2019 22:44
Chloroform	U		0.46	1.0	µg/L	1	9/20/2019 22:44
Chloromethane	U		0.83	1.0	µg/L	1	9/20/2019 22:44
cis-1,2-Dichloroethene	**240**		**2.1**	**5.0**	**µg/L**	5	9/20/2019 03:56
cis-1,3-Dichloropropene	U		0.57	1.0	µg/L	1	9/20/2019 22:44
Dibromochloromethane	U		0.40	1.0	µg/L	1	9/20/2019 22:44
Dibromomethane	U		0.65	1.0	µg/L	1	9/20/2019 22:44
Dichlorodifluoromethane	U		0.68	1.0	µg/L	1	9/20/2019 22:44
Ethylbenzene	U		0.34	1.0	µg/L	1	9/20/2019 22:44
Hexachlorobutadiene	U		0.56	1.0	µg/L	1	9/20/2019 22:44
Hexachloroethane	U		0.45	1.0	µg/L	1	9/20/2019 22:44
Hexane	U		0.40	1.0	µg/L	1	9/20/2019 22:44
Iodomethane	U		2.0	5.0	µg/L	1	9/20/2019 22:44
Isopropylbenzene	U		0.35	1.0	µg/L	1	9/20/2019 22:44
m,p-Xylene	U		0.81	2.0	µg/L	1	9/20/2019 22:44
Methyl tert-butyl ether	U		0.45	1.0	µg/L	1	9/20/2019 22:44
Methylene chloride	U		0.86	5.0	µg/L	1	9/20/2019 22:44
Naphthalene	U		0.77	5.0	µg/L	1	9/20/2019 22:44
n-Butylbenzene	U		0.34	1.0	µg/L	1	9/20/2019 22:44
n-Propylbenzene	U		0.48	1.0	µg/L	1	9/20/2019 22:44
o-Xylene	U		0.31	1.0	µg/L	1	9/20/2019 22:44
p-Isopropyltoluene	U		0.26	1.0	µg/L	1	9/20/2019 22:44
sec-Butylbenzene	U		0.30	1.0	µg/L	1	9/20/2019 22:44
Styrene	U		0.33	1.0	µg/L	1	9/20/2019 22:44
tert-Butyl alcohol	U		2.4	20	µg/L	1	9/20/2019 22:44
tert-Butylbenzene	U		0.39	1.0	µg/L	1	9/20/2019 22:44
Tetrachloroethene	U		0.39	1.0	µg/L	1	9/20/2019 22:44
Tetrahydrofuran	U		0.73	1.0	µg/L	1	9/20/2019 22:44
Toluene	U		0.45	1.0	µg/L	1	9/20/2019 22:44
trans-1,2-Dichloroethene	**11**		**0.48**	**1.0**	**µg/L**	1	9/20/2019 22:44
trans-1,3-Dichloropropene	U		0.38	1.0	µg/L	1	9/20/2019 22:44
trans-1,4-Dichloro-2-butene	U		0.58	2.0	µg/L	1	9/20/2019 22:44
Trichloroethene	**2.0**		**0.43**	**1.0**	**µg/L**	1	9/20/2019 22:44
Trichlorofluoromethane	U		0.52	1.0	µg/L	1	9/20/2019 22:44

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: BB&E, Inc.
Project: SSW Collis 2019 LTM Task 3
Sample ID: COL-GW-15
Collection Date: 9/10/2019 09:45 AM

Work Order: 19090657
Lab ID: 19090657-15
Matrix: GROUNDWATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Vinyl acetate	U		0.83	5.0	µg/L	1	9/20/2019 22:44
Vinyl chloride	**100**		**2.6**	**5.0**	**µg/L**	5	9/20/2019 03:56
Surr: 1,2-Dichloroethane-d4	*98.0*			*75-120*	*%REC*	5	9/20/2019 03:56
Surr: 1,2-Dichloroethane-d4	*101*			*75-120*	*%REC*	1	9/20/2019 22:44
Surr: 4-Bromofluorobenzene	*93.8*			*80-110*	*%REC*	5	9/20/2019 03:56
Surr: 4-Bromofluorobenzene	*93.3*			*80-110*	*%REC*	1	9/20/2019 22:44
Surr: Dibromofluoromethane	*96.6*			*85-115*	*%REC*	5	9/20/2019 03:56
Surr: Dibromofluoromethane	*95.2*			*85-115*	*%REC*	1	9/20/2019 22:44
Surr: Toluene-d8	*99.4*			*85-110*	*%REC*	5	9/20/2019 03:56
Surr: Toluene-d8	*98.1*			*85-110*	*%REC*	1	9/20/2019 22:44

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *25-Sep-19*

Client: BB&E, Inc.
Project: SSW Collis 2019 LTM Task 3
Sample ID: Trip Blank
Collection Date: 9/9/2019

Work Order: 19090657
Lab ID: 19090657-16
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
VOLATILE ORGANIC COMPOUNDS		Method: **SW8260C**					Analyst: **MF**
1,1,1,2-Tetrachloroethane	U		0.38	1.0	µg/L	1	9/20/2019 06:14
1,1,1-Trichloroethane	U		0.46	1.0	µg/L	1	9/20/2019 06:14
1,1,2,2-Tetrachloroethane	U		0.40	1.0	µg/L	1	9/20/2019 06:14
1,1,2-Trichloroethane	U		0.46	1.0	µg/L	1	9/20/2019 06:14
1,1,2-Trichlorotrifluoroethane	U		0.52	1.0	µg/L	1	9/20/2019 06:14
1,1-Dichloroethane	U		0.44	1.0	µg/L	1	9/20/2019 06:14
1,1-Dichloroethene	U		0.40	1.0	µg/L	1	9/20/2019 06:14
1,1-Dichloropropene	U		0.37	1.0	µg/L	1	9/20/2019 06:14
1,2,3-Trichlorobenzene	U		0.42	1.0	µg/L	1	9/20/2019 06:14
1,2,3-Trichloropropane	U		0.40	1.0	µg/L	1	9/20/2019 06:14
1,2,4-Trichlorobenzene	U		0.45	1.0	µg/L	1	9/20/2019 06:14
1,2,4-Trimethylbenzene	U		0.45	1.0	µg/L	1	9/20/2019 06:14
1,2-Dibromo-3-chloropropane	U		0.43	1.0	µg/L	1	9/20/2019 06:14
1,2-Dibromoethane	U		0.41	1.0	µg/L	1	9/20/2019 06:14
1,2-Dichlorobenzene	U		0.32	1.0	µg/L	1	9/20/2019 06:14
1,2-Dichloroethane	U		0.44	1.0	µg/L	1	9/20/2019 06:14
1,2-Dichloropropane	U		0.48	1.0	µg/L	1	9/20/2019 06:14
1,3,5-Trichlorobenzene	U		0.31	1.0	µg/L	1	9/20/2019 06:14
1,3,5-Trimethylbenzene	U		0.65	1.0	µg/L	1	9/20/2019 06:14
1,3-Dichlorobenzene	U		0.33	1.0	µg/L	1	9/20/2019 06:14
1,3-Dichloropropane	U		0.40	1.0	µg/L	1	9/20/2019 06:14
1,4-Dichlorobenzene	U		0.35	1.0	µg/L	1	9/20/2019 06:14
2,2-Dichloropropane	U		0.52	1.0	µg/L	1	9/20/2019 06:14
2-Butanone	U		0.52	5.0	µg/L	1	9/20/2019 06:14
2-Chloroethyl vinyl ether	U		0.82	1.0	µg/L	1	9/20/2019 06:14
2-Chlorotoluene	U		0.36	1.0	µg/L	1	9/20/2019 06:14
2-Hexanone	U		0.59	5.0	µg/L	1	9/20/2019 06:14
2-Methylnaphthalene	U		0.66	5.0	µg/L	1	9/20/2019 06:14
4-Chlorotoluene	U		0.31	1.0	µg/L	1	9/20/2019 06:14
4-Isopropyltoluene	U		0.10	1.0	µg/L	1	9/20/2019 06:14
4-Methyl-2-pentanone	U		0.52	1.0	µg/L	1	9/20/2019 06:14
Acetone	U		1.1	10	µg/L	1	9/20/2019 06:14
Acrolein	U		0.38	1.0	µg/L	1	9/20/2019 06:14
Acrylonitrile	U		0.50	1.0	µg/L	1	9/20/2019 06:14
Benzene	U		0.46	1.0	µg/L	1	9/20/2019 06:14
Benzyl chloride	U		0.34	1.0	µg/L	1	9/20/2019 06:14
Bromobenzene	U		0.38	1.0	µg/L	1	9/20/2019 06:14
Bromochloromethane	U		0.45	1.0	µg/L	1	9/20/2019 06:14

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *25-Sep-19*

Client: BB&E, Inc.
Project: SSW Collis 2019 LTM Task 3
Sample ID: Trip Blank
Collection Date: 9/9/2019

Work Order: 19090657
Lab ID: 19090657-16
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Bromodichloromethane	U		0.49	1.0	µg/L	1	9/20/2019 06:14
Bromoform	U		0.56	1.0	µg/L	1	9/20/2019 06:14
Bromomethane	U		0.90	1.0	µg/L	1	9/20/2019 06:14
Carbon disulfide	U		0.49	1.0	µg/L	1	9/20/2019 06:14
Carbon tetrachloride	U		0.40	1.0	µg/L	1	9/20/2019 06:14
Chlorobenzene	U		0.40	1.0	µg/L	1	9/20/2019 06:14
Chloroethane	U		0.68	1.0	µg/L	1	9/20/2019 06:14
Chloroform	**0.59**	J	**0.46**	**1.0**	**µg/L**	1	9/20/2019 06:14
Chloromethane	U		0.83	1.0	µg/L	1	9/20/2019 06:14
cis-1,2-Dichloroethene	U		0.42	1.0	µg/L	1	9/20/2019 06:14
cis-1,3-Dichloropropene	U		0.57	1.0	µg/L	1	9/20/2019 06:14
Dibromochloromethane	U		0.40	1.0	µg/L	1	9/20/2019 06:14
Dibromomethane	U		0.65	1.0	µg/L	1	9/20/2019 06:14
Dichlorodifluoromethane	U		0.68	1.0	µg/L	1	9/20/2019 06:14
Ethylbenzene	U		0.34	1.0	µg/L	1	9/20/2019 06:14
Hexachlorobutadiene	U		0.56	1.0	µg/L	1	9/20/2019 06:14
Hexachloroethane	U		0.45	1.0	µg/L	1	9/20/2019 06:14
Hexane	U		0.40	1.0	µg/L	1	9/20/2019 06:14
Iodomethane	U		2.0	5.0	µg/L	1	9/20/2019 06:14
Isopropylbenzene	U		0.35	1.0	µg/L	1	9/20/2019 06:14
m,p-Xylene	U		0.81	2.0	µg/L	1	9/20/2019 06:14
Methyl tert-butyl ether	U		0.45	1.0	µg/L	1	9/20/2019 06:14
Methylene chloride	U		0.86	5.0	µg/L	1	9/20/2019 06:14
Naphthalene	U		0.77	5.0	µg/L	1	9/20/2019 06:14
n-Butylbenzene	U		0.34	1.0	µg/L	1	9/20/2019 06:14
n-Propylbenzene	U		0.48	1.0	µg/L	1	9/20/2019 06:14
o-Xylene	U		0.31	1.0	µg/L	1	9/20/2019 06:14
p-Isopropyltoluene	U		0.26	1.0	µg/L	1	9/20/2019 06:14
sec-Butylbenzene	U		0.30	1.0	µg/L	1	9/20/2019 06:14
Styrene	U		0.33	1.0	µg/L	1	9/20/2019 06:14
tert-Butyl alcohol	U		2.4	20	µg/L	1	9/20/2019 06:14
tert-Butylbenzene	U		0.39	1.0	µg/L	1	9/20/2019 06:14
Tetrachloroethene	U		0.39	1.0	µg/L	1	9/20/2019 06:14
Tetrahydrofuran	U		0.73	1.0	µg/L	1	9/20/2019 06:14
Toluene	U		0.45	1.0	µg/L	1	9/20/2019 06:14
trans-1,2-Dichloroethene	U		0.48	1.0	µg/L	1	9/20/2019 06:14
trans-1,3-Dichloropropene	U		0.38	1.0	µg/L	1	9/20/2019 06:14
trans-1,4-Dichloro-2-butene	U		0.58	2.0	µg/L	1	9/20/2019 06:14
Trichloroethene	U		0.43	1.0	µg/L	1	9/20/2019 06:14
Trichlorofluoromethane	U		0.52	1.0	µg/L	1	9/20/2019 06:14

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *25-Sep-19*

Client: BB&E, Inc.
Project: SSW Collis 2019 LTM Task 3
Sample ID: Trip Blank
Collection Date: 9/9/2019

Work Order: 19090657
Lab ID: 19090657-16
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Vinyl acetate	U		0.83	5.0	µg/L	1	9/20/2019 06:14
Vinyl chloride	U		0.53	1.0	µg/L	1	9/20/2019 06:14
Surr: 1,2-Dichloroethane-d4	*97.6*			*75-120*	*%REC*	1	9/20/2019 06:14
Surr: 4-Bromofluorobenzene	*97.2*			*80-110*	*%REC*	1	9/20/2019 06:14
Surr: Dibromofluoromethane	*92.0*			*85-115*	*%REC*	1	9/20/2019 06:14
Surr: Toluene-d8	*101*			*85-110*	*%REC*	1	9/20/2019 06:14

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: 25-Sep-19

Client: BB&E, Inc.

Work Order: 19090657

Project: SSW Collis 2019 LTM Task 3

QC BATCH REPORT

Batch ID: **R271192** Instrument ID **GC10** Method: **RSK-175**

MBLK Sample ID: **MBLK-190923-R271192** Units: **µg/L** Analysis Date: **9/23/2019 02:09 PM**

Client ID: Run ID: **GC10_190923A** SeqNo: **5936732** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	U	5.0								
Ethene	U	5.0								
Methane	U	5.0								

LCS Sample ID: **LCS-190923-R271192** Units: **µg/L** Analysis Date: **9/23/2019 02:07 PM**

Client ID: Run ID: **GC10_190923A** SeqNo: **5936731** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	33.82	5.0	36.1	0	93.7	75-125	0			
Ethene	33.03	5.0	33.7	0	98	75-125	0			
Methane	19.53	5.0	19.2	0	102	75-125	0			

MS Sample ID: **19090588-50H MS** Units: **µg/L** Analysis Date: **9/23/2019 03:13 PM**

Client ID: Run ID: **GC10_190923A** SeqNo: **5936757** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	31.64	5.0	36.1	0	87.6	75-125	0			
Ethene	31.37	5.0	33.7	0	93.1	75-125	0			
Methane	51.14	5.0	19.2	38.88	63.9	75-125	0			S

MS Sample ID: **19090657-05E MS** Units: **µg/L** Analysis Date: **9/23/2019 03:17 PM**

Client ID: **COL-GW-05** Run ID: **GC10_190923A** SeqNo: **5936759** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	29.68	5.0	36.1	1.05	79.3	75-125	0			
Ethene	28.28	5.0	33.7	0	83.9	75-125	0			
Methane	27.78	5.0	19.2	12.07	81.8	75-125	0			

MSD Sample ID: **19090588-50H MSD** Units: **µg/L** Analysis Date: **9/23/2019 03:15 PM**

Client ID: Run ID: **GC10_190923A** SeqNo: **5936758** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	30.81	5.0	36.1	0	85.3	75-125	31.64	2.66	20	
Ethene	30.2	5.0	33.7	0	89.6	75-125	31.37	3.8	20	
Methane	51.7	5.0	19.2	38.88	66.8	75-125	51.14	1.09	20	S

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: BB&E, Inc.
Work Order: 19090657
Project: SSW Collis 2019 LTM Task 3

QC BATCH REPORT

Batch ID: **R271192** Instrument ID **GC10** Method: **RSK-175**

MSD Sample ID: **19090657-05E MSD** Units: **µg/L** Analysis Date: **9/23/2019 03:19 PM**
Client ID: **COL-GW-05** Run ID: **GC10_190923A** SeqNo: **5936760** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	29.27	5.0	36.1	1.05	78.2	75-125	29.68	1.39	20	
Ethene	28.46	5.0	33.7	0	84.5	75-125	28.28	0.634	20	
Methane	24.45	5.0	19.2	12.07	64.5	75-125	27.78	12.8	20	S

The following samples were analyzed in this batch: 19090657-05E 19090657-06E 19090657-12E 19090657-13E

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: BB&E, Inc.
Work Order: 19090657
Project: SSW Collis 2019 LTM Task 3

QC BATCH REPORT

Batch ID: **142724** Instrument ID **ICPMS4** Method: **SW6020A** **(Dissolve)**

MBLK Sample ID: **MBLK-142724-142724** Units: **mg/L** Analysis Date: **9/20/2019 04:35 PM**
Client ID: Run ID: **ICPMS4_190920A** SeqNo: **5935021** Prep Date: **9/20/2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Iron	U	0.080								
Manganese	U	0.0050								

LCS Sample ID: **LCS-142724-142724** Units: **mg/L** Analysis Date: **9/20/2019 04:37 PM**
Client ID: Run ID: **ICPMS4_190920A** SeqNo: **5935022** Prep Date: **9/20/2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Iron	9.76	0.080	10	0	97.6	80-120	0			
Manganese	0.09586	0.0050	0.1	0	95.9	80-120	0			

MS Sample ID: **19090657-05BMS** Units: **mg/L** Analysis Date: **9/24/2019 06:56 PM**
Client ID: **COL-GW-05** Run ID: **ICPMS3_190924A** SeqNo: **5943244** Prep Date: **9/20/2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Iron	10.1	0.080	10	0.2703	98.3	75-125	0			
Manganese	0.1451	0.0050	0.1	0.04786	97.3	75-125	0			

MSD Sample ID: **19090657-05BMSD** Units: **mg/L** Analysis Date: **9/24/2019 06:58 PM**
Client ID: **COL-GW-05** Run ID: **ICPMS3_190924A** SeqNo: **5943245** Prep Date: **9/20/2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Iron	10.18	0.080	10	0.2703	99.1	75-125	10.1	0.751	20	
Manganese	0.1455	0.0050	0.1	0.04786	97.6	75-125	0.1451	0.233	20	

The following samples were analyzed in this batch: 19090657-05B, 19090657-06B, 19090657-12B, 19090657-13B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: BB&E, Inc.
Work Order: 19090657
Project: SSW Collis 2019 LTM Task 3

QC BATCH REPORT

Batch ID: **R270769A** Instrument ID **VMS9** Method: **SW8260B**

MBLK Sample ID: **VBLKW1-190917-R270769A** Units: **µg/L** Analysis Date: **9/17/2019 04:25 PM**
Client ID: Run ID: **VMS9_190917A** SeqNo: **5925224** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	U	1.0								
Surr: Toluene-d8	*10.74*	0	*10*	0	*107*	*74-124*	0			

LCS Sample ID: **VLCSW1-190917-R270769A** Units: **µg/L** Analysis Date: **9/17/2019 03:38 PM**
Client ID: Run ID: **VMS9_190917A** SeqNo: **5925222** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	38.94	1.0	40	0	97.4	70-130	0			
Surr: Toluene-d8	*9.83*	0	*10*	0	*98.3*	*74-124*	0			

MS Sample ID: **19090657-05A MS** Units: **µg/L** Analysis Date: **9/17/2019 10:44 PM**
Client ID: **COL-GW-05** Run ID: **VMS9_190917A** SeqNo: **5925258** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	42.96	1.0	40	0	107	70-130	0			
Surr: Toluene-d8	*10.38*	0	*10*	0	*104*	*74-124*	0			

MSD Sample ID: **19090657-05A MSD** Units: **µg/L** Analysis Date: **9/17/2019 11:00 PM**
Client ID: **COL-GW-05** Run ID: **VMS9_190917A** SeqNo: **5925260** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	43.28	1.0	40	0	108	70-130	42.96	0.742	30	
Surr: Toluene-d8	*10.7*	0	*10*	0	*107*	*74-124*	10.38	*3.04*	*30*	

The following samples were analyzed in this batch: 19090657-01A 19090657-05A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: BB&E, Inc.
Work Order: 19090657
Project: SSW Collis 2019 LTM Task 3

QC BATCH REPORT

Batch ID: **R270847A** Instrument ID **VMS9** Method: **SW8260B**

MBLK Sample ID: **VBLKW1-190918-R270847A** Units: **µg/L** Analysis Date: **9/18/2019 10:54 AM**
Client ID: Run ID: **VMS9_190918A** SeqNo: **5927679** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	U	1.0								
Surr: Toluene-d8	*10.69*	0	*10*	0	*107*	*74-124*	0			

LCS Sample ID: **VLCSW1-190918-R270847A** Units: **µg/L** Analysis Date: **9/18/2019 10:07 AM**
Client ID: Run ID: **VMS9_190918A** SeqNo: **5927678** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	39.54	1.0	40	0	98.8	70-130	0			
Surr: Toluene-d8	*10.71*	0	*10*	0	*107*	*74-124*	0			

MS Sample ID: **19090788-02A MS** Units: **µg/L** Analysis Date: **9/18/2019 01:59 PM**
Client ID: Run ID: **VMS9_190918A** SeqNo: **5927689** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	44.38	1.0	40	0	111	70-130	0			
Surr: Toluene-d8	*11.86*	0	*10*	0	*119*	*74-124*	0			

DUP Sample ID: **19090788-01A DUP** Units: **µg/L** Analysis Date: **9/18/2019 01:44 PM**
Client ID: Run ID: **VMS9_190918A** SeqNo: **5927688** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	U	1.0	0	0	0		0	0	30	
Surr: Toluene-d8	*10.59*	0	*10*	0	*106*	*74-124*	10.56	*0.284*	*30*	

The following samples were analyzed in this batch: 19090657-06A 19090657-12A 19090657-13A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: BB&E, Inc.
Work Order: 19090657
Project: SSW Collis 2019 LTM Task 3

QC BATCH REPORT

Batch ID: **R270981A** Instrument ID **VMS6** Method: **SW8260C**

MBLK Sample ID: **VBLKW2-190919-R270981A** Units: **µg/L** Analysis Date: **9/20/2019 01:54 AM**
Client ID: Run ID: **VMS6_190919A** SeqNo: **5932147** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	U	1.0								
1,1,1-Trichloroethane	U	1.0								
1,1,2,2-Tetrachloroethane	U	1.0								
1,1,2-Trichloroethane	U	1.0								
1,1,2-Trichlorotrifluoroethane	U	1.0								
1,1-Dichloroethane	U	1.0								
1,1-Dichloroethene	U	1.0								
1,1-Dichloropropene	U	1.0								
1,2,3-Trichlorobenzene	0.52	1.0								J
1,2,3-Trichloropropane	U	1.0								
1,2,4-Trichlorobenzene	U	1.0								
1,2,4-Trimethylbenzene	U	1.0								
1,2-Dibromo-3-chloropropane	U	1.0								
1,2-Dibromoethane	U	1.0								
1,2-Dichlorobenzene	U	1.0								
1,2-Dichloroethane	U	1.0								
1,2-Dichloropropane	U	1.0								
1,3,5-Trichlorobenzene	U	1.0								
1,3,5-Trimethylbenzene	U	1.0								
1,3-Dichlorobenzene	U	1.0								
1,3-Dichloropropane	U	1.0								
1,4-Dichlorobenzene	U	1.0								
2,2-Dichloropropane	U	1.0								
2-Butanone	U	5.0								
2-Chloroethyl vinyl ether	U	1.0								
2-Chlorotoluene	U	1.0								
2-Hexanone	U	5.0								
2-Methylnaphthalene	U	5.0								
4-Chlorotoluene	U	1.0								
4-Isopropyltoluene	U	1.0								
4-Methyl-2-pentanone	U	1.0								
Acetone	U	10								
Acrolein	U	1.0								
Acrylonitrile	U	1.0								
Benzene	U	1.0								
Benzyl chloride	U	1.0								
Bromobenzene	U	1.0								
Bromochloromethane	U	1.0								
Bromodichloromethane	U	1.0								
Bromoform	U	1.0								
Bromomethane	U	1.0								
Carbon disulfide	0.5	1.0								J

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **R270981A** Instrument ID **VMS6** Method: **SW8260C**

Carbon tetrachloride	U	1.0						
Chlorobenzene	U	1.0						
Chloroethane	U	1.0						
Chloroform	U	1.0						
Chloromethane	U	1.0						
cis-1,2-Dichloroethene	U	1.0						
cis-1,3-Dichloropropene	U	1.0						
Dibromochloromethane	U	1.0						
Dibromomethane	U	1.0						
Dichlorodifluoromethane	U	1.0						
Ethylbenzene	U	1.0						
Hexachlorobutadiene	0.79	1.0						J
Hexachloroethane	U	1.0						
Hexane	U	1.0						
Iodomethane	U	5.0						
Isopropylbenzene	U	1.0						
m,p-Xylene	U	2.0						
Methyl tert-butyl ether	U	1.0						
Methylene chloride	U	5.0						
Naphthalene	U	5.0						
n-Butylbenzene	U	1.0						
n-Propylbenzene	U	1.0						
o-Xylene	U	1.0						
p-Isopropyltoluene	U	1.0						
sec-Butylbenzene	U	1.0						
Styrene	U	1.0						
tert-Butyl alcohol	U	20						
tert-Butylbenzene	U	1.0						
Tetrachloroethene	U	1.0						
Tetrahydrofuran	U	1.0						
Toluene	U	1.0						
trans-1,2-Dichloroethene	U	1.0						
trans-1,3-Dichloropropene	U	1.0						
trans-1,4-Dichloro-2-butene	U	2.0						
Trichloroethene	U	1.0						
Trichlorofluoromethane	U	1.0						
Vinyl acetate	U	5.0						
Vinyl chloride	U	1.0						
Surr: 1,2-Dichloroethane-d4	*19.94*	0	*20*	0	*99.7*	*75-120*	0	
Surr: 4-Bromofluorobenzene	*19.43*	0	*20*	0	*97.2*	*80-110*	0	
Surr: Dibromofluoromethane	*18.59*	0	*20*	0	*93*	*85-115*	0	
Surr: Toluene-d8	*19.69*	0	*20*	0	*98.4*	*85-110*	0	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: BB&E, Inc.
Work Order: 19090657
Project: SSW Collis 2019 LTM Task 3

QC BATCH REPORT

Batch ID: **R270981A** Instrument ID **VMS6** Method: **SW8260C**

LCS Sample ID: **VLCSW3-190919-R270981A** Units: **µg/L** Analysis Date: **9/20/2019 01:05 AM**
Client ID: Run ID: **VMS6_190919A** SeqNo: **5932146** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	18.18	1.0	20	0	90.9	73-114	0			
1,1,1-Trichloroethane	17.73	1.0	20	0	88.6	75-130	0			
1,1,2,2-Tetrachloroethane	18.99	1.0	20	0	95	75-130	0			
1,1,2-Trichloroethane	17.61	1.0	20	0	88	75-125	0			
1,1-Dichloroethane	19.23	1.0	20	0	96.2	68-142	0			
1,1-Dichloroethene	20.49	1.0	20	0	102	70-145	0			
1,1-Dichloropropene	17.58	1.0	20	0	87.9	75-135	0			
1,2,3-Trichlorobenzene	19.55	1.0	20	0	97.8	70-140	0			
1,2,3-Trichloropropane	18.09	1.0	20	0	90.4	75-125	0			
1,2,4-Trichlorobenzene	18.83	1.0	20	0	94.2	70-135	0			
1,2,4-Trimethylbenzene	17.39	1.0	20	0	87	75-130	0			
1,2-Dibromo-3-chloropropane	17.47	1.0	20	0	87.4	60-130	0			
1,2-Dibromoethane	19.82	1.0	20	0	99.1	67-155	0			
1,2-Dichlorobenzene	18.89	1.0	20	0	94.4	70-130	0			
1,2-Dichloroethane	17.94	1.0	20	0	89.7	78-125	0			
1,2-Dichloropropane	17.97	1.0	20	0	89.8	75-125	0			
1,3,5-Trimethylbenzene	17.38	1.0	20	0	86.9	75-130	0			
1,3-Dichlorobenzene	19.12	1.0	20	0	95.6	75-130	0			
1,3-Dichloropropane	19.02	1.0	20	0	95.1	75-125	0			
1,4-Dichlorobenzene	18.69	1.0	20	0	93.4	75-130	0			
2,2-Dichloropropane	16.64	1.0	20	0	83.2	43-150	0			
2-Butanone	19.02	5.0	20	0	95.1	55-150	0			
2-Chlorotoluene	18.57	1.0	20	0	92.8	76-117	0			
2-Hexanone	17.13	5.0	20	0	85.6	60-135	0			
4-Chlorotoluene	18.42	1.0	20	0	92.1	80-125	0			
4-Isopropyltoluene	17.83	1.0	20	0	89.2	61-164	0			
4-Methyl-2-pentanone	20.25	1.0	20	0	101	77-178	0			
Acetone	17.21	10	20	0	86	60-160	0			
Acrylonitrile	16.75	1.0	20	0	83.8	60-140	0			
Benzene	17.88	1.0	20	0	89.4	70-130	0			
Bromobenzene	18.47	1.0	20	0	92.4	80-125	0			
Bromochloromethane	18.3	1.0	20	0	91.5	72-141	0			
Bromodichloromethane	18.97	1.0	20	0	94.8	75-125	0			
Bromoform	17.04	1.0	20	0	85.2	60-125	0			
Bromomethane	31.6	1.0	20	0	158	30-185	0			
Carbon disulfide	18.78	1.0	20	0	93.9	60-165	0			
Carbon tetrachloride	18.55	1.0	20	0	92.8	65-140	0			
Chlorobenzene	18.94	1.0	20	0	94.7	80-120	0			
Chloroethane	18.18	1.0	20	0	90.9	31-172	0			
Chloroform	18.31	1.0	20	0	91.6	66-135	0			
Chloromethane	23.23	1.0	20	0	116	46-148	0			
cis-1,2-Dichloroethene	19.5	1.0	20	0	97.5	75-134	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **R270981A** Instrument ID **VMS6** Method: **SW8260C**

cis-1,3-Dichloropropene	18.29	1.0	20	0	91.4	70-130	0
Dibromochloromethane	17.84	1.0	20	0	89.2	60-115	0
Dibromomethane	18.96	1.0	20	0	94.8	79-126	0
Dichlorodifluoromethane	23.07	1.0	20	0	115	20-120	0
Ethylbenzene	18.01	1.0	20	0	90	76-123	0
Hexachlorobutadiene	20.12	1.0	20	0	101	70-155	0
Hexachloroethane	15.59	1.0	20	0	78	50-124	0
Iodomethane	19.46	5.0	20	0	97.3	60-160	0
Isopropylbenzene	17.88	1.0	20	0	89.4	80-127	0
m,p-Xylene	35.87	2.0	40	0	89.7	75-130	0
Methyl tert-butyl ether	17.76	1.0	20	0	88.8	68-129	0
Methylene chloride	19.78	5.0	20	0	98.9	72-125	0
Naphthalene	18.8	5.0	20	0	94	55-160	0
n-Butylbenzene	17.47	1.0	20	0	87.4	75-145	0
n-Propylbenzene	18.31	1.0	20	0	91.6	76-116	0
o-Xylene	18.56	1.0	20	0	92.8	76-127	0
p-Isopropyltoluene	17.83	1.0	20	0	89.2	61-164	0
sec-Butylbenzene	18.02	1.0	20	0	90.1	80-134	0
Styrene	18.5	1.0	20	0	92.5	83-137	0
tert-Butyl alcohol	86.83	20	100	0	86.8	70-130	0
tert-Butylbenzene	17.99	1.0	20	0	90	70-130	0
Tetrachloroethene	19.01	1.0	20	0	95	68-166	0
Tetrahydrofuran	16.93	1.0	20	0	84.6	54-139	0
Toluene	18.02	1.0	20	0	90.1	76-125	0
trans-1,2-Dichloroethene	19.52	1.0	20	0	97.6	80-140	0
trans-1,3-Dichloropropene	17.83	1.0	20	0	89.2	56-132	0
trans-1,4-Dichloro-2-butene	11.11	2.0	20	0	55.6	46-118	0
Trichloroethene	18.26	1.0	20	0	91.3	77-125	0
Trichlorofluoromethane	16.91	1.0	20	0	84.6	60-140	0
Vinyl chloride	19.65	1.0	20	0	98.2	50-136	0
Surr: 1,2-Dichloroethane-d4	*19.31*	0	*20*	0	*96.6*	*75-120*	0
Surr: 4-Bromofluorobenzene	*19.97*	0	*20*	0	*99.8*	*80-110*	0
Surr: Dibromofluoromethane	*19.76*	0	*20*	0	*98.8*	*85-115*	0
Surr: Toluene-d8	*20.24*	0	*20*	0	*101*	*85-110*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: BB&E, Inc.
Work Order: 19090657
Project: SSW Collis 2019 LTM Task 3

QC BATCH REPORT

Batch ID: **R270981A** Instrument ID **VMS6** Method: **SW8260C**

MS Sample ID: **19090657-12A MS** Units: **µg/L** Analysis Date: **9/20/2019 10:29 AM**
Client ID: **COL-GW-12** Run ID: **VMS6_190919A** SeqNo: **5932154** Prep Date: DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	86.95	5.0	100	0	87	73-114	0			
1,1,1-Trichloroethane	91.7	5.0	100	0	91.7	75-130	0			
1,1,2,2-Tetrachloroethane	89.8	5.0	100	0	89.8	75-130	0			
1,1,2-Trichloroethane	88	5.0	100	0	88	75-125	0			
1,1-Dichloroethane	96.75	5.0	100	0	96.8	68-142	0			
1,1-Dichloroethene	115	5.0	100	2.7	112	70-145	0			
1,1-Dichloropropene	99.45	5.0	100	0	99.4	75-135	0			
1,2,3-Trichlorobenzene	91.15	5.0	100	0	91.2	70-140	0			
1,2,3-Trichloropropane	86.15	5.0	100	0	86.2	75-125	0			
1,2,4-Trichlorobenzene	90.55	5.0	100	1.2	89.4	70-135	0			
1,2,4-Trimethylbenzene	89	5.0	100	0	89	75-130	0			
1,2-Dibromo-3-chloropropane	81.25	5.0	100	0	81.2	60-130	0			
1,2-Dibromoethane	93.65	5.0	100	0	93.6	67-155	0			
1,2-Dichlorobenzene	93.8	5.0	100	0	93.8	70-130	0			
1,2-Dichloroethane	87.8	5.0	100	0	87.8	78-125	0			
1,2-Dichloropropane	94.1	5.0	100	0	94.1	75-125	0			
1,3,5-Trimethylbenzene	89.7	5.0	100	0	89.7	75-130	0			
1,3-Dichlorobenzene	95.6	5.0	100	0	95.6	75-130	0			
1,3-Dichloropropane	91.05	5.0	100	0	91	75-125	0			
1,4-Dichlorobenzene	94.3	5.0	100	0	94.3	75-130	0			
2,2-Dichloropropane	65.35	5.0	100	0	65.4	43-150	0			
2-Butanone	83.6	25	100	0	83.6	55-150	0			
2-Chlorotoluene	93.7	5.0	100	0	93.7	76-117	0			
2-Hexanone	83.9	25	100	0	83.9	60-135	0			
4-Chlorotoluene	93.05	5.0	100	0	93	80-125	0			
4-Isopropyltoluene	95.55	5.0	100	0	95.6	61-164	0			
4-Methyl-2-pentanone	101.6	5.0	100	0	102	77-178	0			
Acetone	94.1	50	100	8.2	85.9	60-160	0			
Acrylonitrile	80.1	5.0	100	0	80.1	60-140	0			
Benzene	95.85	5.0	100	0	95.8	70-130	0			
Bromobenzene	88.7	5.0	100	0	88.7	80-125	0			
Bromochloromethane	86.2	5.0	100	0	86.2	72-141	0			
Bromodichloromethane	90.35	5.0	100	0	90.4	75-125	0			
Bromoform	72.25	5.0	100	0	72.2	60-125	0			
Bromomethane	98.2	5.0	100	0	98.2	30-185	0			
Carbon disulfide	94.3	5.0	100	1.5	92.8	60-165	0			
Carbon tetrachloride	103.2	5.0	100	0	103	65-140	0			
Chlorobenzene	92.4	5.0	100	0	92.4	80-120	0			
Chloroethane	101.2	5.0	100	0	101	31-172	0			
Chloroform	92.05	5.0	100	0	92	66-135	0			
Chloromethane	108.6	5.0	100	2.45	106	46-148	0			
cis-1,2-Dichloroethene	358.6	5.0	100	260.8	97.8	75-134	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: BB&E, Inc.
Work Order: 19090657
Project: SSW Collis 2019 LTM Task 3

QC BATCH REPORT

Batch ID: **R270981A**	Instrument ID **VMS6**			Method: **SW8260C**				
cis-1,3-Dichloropropene	82.15	5.0	100	0	82.2	70-130	0	
Dibromochloromethane	77.75	5.0	100	0	77.8	60-115	0	
Dibromomethane	96.1	5.0	100	0	96.1	79-126	0	
Dichlorodifluoromethane	132.6	5.0	100	0	133	20-120	0	S
Ethylbenzene	92.4	5.0	100	0	92.4	76-123	0	
Hexachlorobutadiene	117.7	5.0	100	1.5	116	70-155	0	
Hexachloroethane	68.8	5.0	100	0	68.8	50-124	0	
Iodomethane	106.7	25	100	5.8	101	60-160	0	
Isopropylbenzene	94.3	5.0	100	0	94.3	80-127	0	
m,p-Xylene	185.5	10	200	0	92.8	75-130	0	
Methyl tert-butyl ether	85.65	5.0	100	0	85.6	68-129	0	
Methylene chloride	100.5	25	100	0	100	72-125	0	
Naphthalene	91.3	25	100	0	91.3	55-160	0	
n-Butylbenzene	94	5.0	100	0	94	75-145	0	
n-Propylbenzene	95.6	5.0	100	0	95.6	76-116	0	
o-Xylene	93.6	5.0	100	0	93.6	76-127	0	
p-Isopropyltoluene	95.55	5.0	100	0	95.6	61-164	0	
sec-Butylbenzene	96.1	5.0	100	0	96.1	80-134	0	
Styrene	92.1	5.0	100	0	92.1	83-137	0	
tert-Butyl alcohol	429.9	100	500	0	86	70-130	0	
tert-Butylbenzene	94.15	5.0	100	0	94.2	70-130	0	
Tetrachloroethene	104.7	5.0	100	0	105	68-166	0	
Tetrahydrofuran	81.55	5.0	100	0	81.6	54-139	0	
Toluene	93.3	5.0	100	0	93.3	76-125	0	
trans-1,2-Dichloroethene	109.2	5.0	100	9.5	99.7	80-140	0	
trans-1,3-Dichloropropene	74.6	5.0	100	0	74.6	56-132	0	
trans-1,4-Dichloro-2-butene	46.65	10	100	0	46.6	46-118	0	
Trichloroethene	325.1	5.0	100	217.8	107	77-125	0	
Trichlorofluoromethane	96	5.0	100	0	96	60-140	0	
Vinyl chloride	133	5.0	100	28.2	105	50-136	0	
Surr: 1,2-Dichloroethane-d4	*97.85*	0	*100*	0	*97.8*	*75-120*	0	
Surr: 4-Bromofluorobenzene	*97.75*	0	*100*	0	*97.8*	*80-110*	0	
Surr: Dibromofluoromethane	*96.25*	0	*100*	0	*96.2*	*85-115*	0	
Surr: Toluene-d8	*99.05*	0	*100*	0	*99*	*85-110*	0	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: BB&E, Inc.
Work Order: 19090657
Project: SSW Collis 2019 LTM Task 3

QC BATCH REPORT

Batch ID: **R270981A** Instrument ID **VMS6** Method: **SW8260C**

MSD Sample ID: **19090657-12A MSD** Units: **µg/L** Analysis Date: **9/20/2019 10:53 AM**
Client ID: **COL-GW-12** Run ID: **VMS6_190919A** SeqNo: **5932155** Prep Date: DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	90.8	5.0	100	0	90.8	73-114	86.95	4.33	30	
1,1,1-Trichloroethane	98.7	5.0	100	0	98.7	75-130	91.7	7.35	30	
1,1,2,2-Tetrachloroethane	94.05	5.0	100	0	94	75-130	89.8	4.62	30	
1,1,2-Trichloroethane	88.8	5.0	100	0	88.8	75-125	88	0.905	30	
1,1-Dichloroethane	103.6	5.0	100	0	104	68-142	96.75	6.79	30	
1,1-Dichloroethene	122.2	5.0	100	2.7	119	70-145	115	6.07	30	
1,1-Dichloropropene	97.45	5.0	100	0	97.4	75-135	99.45	2.03	30	
1,2,3-Trichlorobenzene	100.8	5.0	100	0	101	70-140	91.15	10.1	30	
1,2,3-Trichloropropane	92.65	5.0	100	0	92.6	75-125	86.15	7.27	30	
1,2,4-Trichlorobenzene	96.4	5.0	100	1.2	95.2	70-135	90.55	6.26	30	
1,2,4-Trimethylbenzene	93.5	5.0	100	0	93.5	75-130	89	4.93	30	
1,2-Dibromo-3-chloropropane	91.9	5.0	100	0	91.9	60-130	81.25	12.3	30	
1,2-Dibromoethane	97.4	5.0	100	0	97.4	67-155	93.65	3.93	30	
1,2-Dichlorobenzene	93.5	5.0	100	0	93.5	70-130	93.8	0.32	30	
1,2-Dichloroethane	88.9	5.0	100	0	88.9	78-125	87.8	1.25	30	
1,2-Dichloropropane	92.65	5.0	100	0	92.6	75-125	94.1	1.55	30	
1,3,5-Trimethylbenzene	93.25	5.0	100	0	93.2	75-130	89.7	3.88	30	
1,3-Dichlorobenzene	97.2	5.0	100	0	97.2	75-130	95.6	1.66	30	
1,3-Dichloropropane	93.7	5.0	100	0	93.7	75-125	91.05	2.87	30	
1,4-Dichlorobenzene	94.15	5.0	100	0	94.2	75-130	94.3	0.159	30	
2,2-Dichloropropane	70.95	5.0	100	0	71	43-150	65.35	8.22	30	
2-Butanone	89.9	25	100	0	89.9	55-150	83.6	7.26	30	
2-Chlorotoluene	98.95	5.0	100	0	99	76-117	93.7	5.45	30	
2-Hexanone	89	25	100	0	89	60-135	83.9	5.9	30	
4-Chlorotoluene	97.05	5.0	100	0	97	80-125	93.05	4.21	30	
4-Isopropyltoluene	93.5	5.0	100	0	93.5	61-164	95.55	2.17	30	
4-Methyl-2-pentanone	117.3	5.0	100	0	117	77-178	101.6	14.3	30	
Acetone	104.3	50	100	8.2	96.1	60-160	94.1	10.3	30	
Acrylonitrile	85.9	5.0	100	0	85.9	60-140	80.1	6.99	30	
Benzene	95.8	5.0	100	0	95.8	70-130	95.85	0.0522	30	
Bromobenzene	94.6	5.0	100	0	94.6	80-125	88.7	6.44	30	
Bromochloromethane	96.95	5.0	100	0	97	72-141	86.2	11.7	30	
Bromodichloromethane	92.95	5.0	100	0	93	75-125	90.35	2.84	30	
Bromoform	76.5	5.0	100	0	76.5	60-125	72.25	5.71	30	
Bromomethane	115.2	5.0	100	0	115	30-185	98.2	15.9	30	
Carbon disulfide	99.9	5.0	100	1.5	98.4	60-165	94.3	5.77	30	
Carbon tetrachloride	106	5.0	100	0	106	65-140	103.2	2.68	30	
Chlorobenzene	98	5.0	100	0	98	80-120	92.4	5.88	30	
Chloroethane	107	5.0	100	0	107	31-172	101.2	5.52	30	
Chloroform	97.35	5.0	100	0	97.4	66-135	92.05	5.6	30	
Chloromethane	111	5.0	100	2.45	108	46-148	108.6	2.09	30	
cis-1,2-Dichloroethene	376.4	5.0	100	260.8	116	75-134	358.6	4.84	30	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: BB&E, Inc.
Work Order: 19090657
Project: SSW Collis 2019 LTM Task 3

QC BATCH REPORT

Batch ID: **R270981A**	Instrument ID **VMS6**			Method: **SW8260C**						
cis-1,3-Dichloropropene	84.7	5.0	100	0	84.7	70-130	82.15	3.06	30	
Dibromochloromethane	84.4	5.0	100	0	84.4	60-115	77.75	8.2	30	
Dibromomethane	102	5.0	100	0	102	79-126	96.1	5.96	30	
Dichlorodifluoromethane	137	5.0	100	0	137	20-120	132.6	3.3	30	S
Ethylbenzene	94.75	5.0	100	0	94.8	76-123	92.4	2.51	30	
Hexachlorobutadiene	98.6	5.0	100	1.5	97.1	70-155	117.7	17.7	30	
Hexachloroethane	71.1	5.0	100	0	71.1	50-124	68.8	3.29	30	
Iodomethane	114.8	25	100	5.8	109	60-160	106.7	7.31	30	
Isopropylbenzene	96.8	5.0	100	0	96.8	80-127	94.3	2.62	30	
m,p-Xylene	191	10	200	0	95.5	75-130	185.5	2.9	30	
Methyl tert-butyl ether	92.2	5.0	100	0	92.2	68-129	85.65	7.37	30	
Methylene chloride	106.6	25	100	0	107	72-125	100.5	5.84	30	
Naphthalene	99.3	25	100	0	99.3	55-160	91.3	8.39	30	
n-Butylbenzene	90.35	5.0	100	0	90.4	75-145	94	3.96	30	
n-Propylbenzene	98.9	5.0	100	0	98.9	76-116	95.6	3.39	30	
o-Xylene	97.6	5.0	100	0	97.6	76-127	93.6	4.18	30	
p-Isopropyltoluene	93.5	5.0	100	0	93.5	61-164	95.55	2.17	30	
sec-Butylbenzene	95.55	5.0	100	0	95.6	80-134	96.1	0.574	30	
Styrene	96.4	5.0	100	0	96.4	83-137	92.1	4.56	30	
tert-Butyl alcohol	446.2	100	500	0	89.2	70-130	429.9	3.72	30	
tert-Butylbenzene	95.35	5.0	100	0	95.4	70-130	94.15	1.27	30	
Tetrachloroethene	105.4	5.0	100	0	105	68-166	104.7	0.666	30	
Tetrahydrofuran	89.4	5.0	100	0	89.4	54-139	81.55	9.18	30	
Toluene	96.25	5.0	100	0	96.2	76-125	93.3	3.11	30	
trans-1,2-Dichloroethene	118.5	5.0	100	9.5	109	80-140	109.2	8.17	30	
trans-1,3-Dichloropropene	79.8	5.0	100	0	79.8	56-132	74.6	6.74	30	
trans-1,4-Dichloro-2-butene	48	10	100	0	48	46-118	46.65	2.85	30	
Trichloroethene	329.7	5.0	100	217.8	112	77-125	325.1	1.41	30	
Trichlorofluoromethane	104.7	5.0	100	0	105	60-140	96	8.67	30	
Vinyl chloride	141.4	5.0	100	28.2	113	50-136	133	6.12	30	
Surr: 1,2-Dichloroethane-d4	*97*	0	*100*	0	*97*	*75-120*	97.85	*0.872*	*30*	
Surr: 4-Bromofluorobenzene	*96.8*	0	*100*	0	*96.8*	*80-110*	97.75	*0.977*	*30*	
Surr: Dibromofluoromethane	*100.4*	0	*100*	0	*100*	*85-115*	96.25	*4.22*	*30*	
Surr: Toluene-d8	*99.4*	0	*100*	0	*99.4*	*85-110*	99.05	*0.353*	*30*	

The following samples were analyzed in this batch: 19090657-12A, 19090657-13A, 19090657-14A, 19090657-15A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: BB&E, Inc.
Work Order: 19090657
Project: SSW Collis 2019 LTM Task 3

QC BATCH REPORT

Batch ID: **R271001B** Instrument ID **VMS6** Method: **SW8260C**

MBLK Sample ID: **VBLKW1-190920-R271001B** Units: **µg/L** Analysis Date: **9/20/2019 02:22 PM**
Client ID: Run ID: **VMS6_190920A** SeqNo: **5933672** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	U	1.0								
1,1,1-Trichloroethane	U	1.0								
1,1,2,2-Tetrachloroethane	U	1.0								
1,1,2-Trichloroethane	U	1.0								
1,1,2-Trichlorotrifluoroethane	U	1.0								
1,1-Dichloroethane	U	1.0								
1,1-Dichloroethene	U	1.0								
1,1-Dichloropropene	U	1.0								
1,2,3-Trichlorobenzene	U	1.0								
1,2,3-Trichloropropane	U	1.0								
1,2,4-Trichlorobenzene	U	1.0								
1,2,4-Trimethylbenzene	U	1.0								
1,2-Dibromo-3-chloropropane	U	1.0								
1,2-Dibromoethane	U	1.0								
1,2-Dichlorobenzene	U	1.0								
1,2-Dichloroethane	U	1.0								
1,2-Dichloropropane	U	1.0								
1,3,5-Trichlorobenzene	U	1.0								
1,3,5-Trimethylbenzene	U	1.0								
1,3-Dichlorobenzene	U	1.0								
1,3-Dichloropropane	U	1.0								
1,4-Dichlorobenzene	U	1.0								
2,2-Dichloropropane	U	1.0								
2-Butanone	U	5.0								
2-Chloroethyl vinyl ether	U	1.0								
2-Chlorotoluene	U	1.0								
2-Hexanone	U	5.0								
2-Methylnaphthalene	U	5.0								
4-Chlorotoluene	U	1.0								
4-Isopropyltoluene	U	1.0								
4-Methyl-2-pentanone	U	1.0								
Acetone	U	10								
Acrolein	U	1.0								
Acrylonitrile	U	1.0								
Benzene	U	1.0								
Benzyl chloride	U	1.0								
Bromobenzene	U	1.0								
Bromochloromethane	U	1.0								
Bromodichloromethane	U	1.0								
Bromoform	U	1.0								
Bromomethane	1.73	1.0								
Carbon disulfide	U	1.0								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **R271001B** Instrument ID **VMS6** Method: **SW8260C**

Carbon tetrachloride	U	1.0						
Chlorobenzene	U	1.0						
Chloroethane	U	1.0						
Chloroform	U	1.0						
Chloromethane	U	1.0						
cis-1,2-Dichloroethene	U	1.0						
cis-1,3-Dichloropropene	U	1.0						
Dibromochloromethane	U	1.0						
Dibromomethane	U	1.0						
Dichlorodifluoromethane	U	1.0						
Ethylbenzene	U	1.0						
Hexachlorobutadiene	0.82	1.0						J
Hexachloroethane	U	1.0						
Hexane	U	1.0						
Iodomethane	U	5.0						
Isopropylbenzene	U	1.0						
m,p-Xylene	U	2.0						
Methyl tert-butyl ether	U	1.0						
Methylene chloride	U	5.0						
Naphthalene	U	5.0						
n-Butylbenzene	U	1.0						
n-Propylbenzene	U	1.0						
o-Xylene	U	1.0						
p-Isopropyltoluene	U	1.0						
sec-Butylbenzene	U	1.0						
Styrene	U	1.0						
tert-Butyl alcohol	U	20						
tert-Butylbenzene	U	1.0						
Tetrachloroethene	U	1.0						
Tetrahydrofuran	U	1.0						
Toluene	U	1.0						
trans-1,2-Dichloroethene	U	1.0						
trans-1,3-Dichloropropene	U	1.0						
trans-1,4-Dichloro-2-butene	U	2.0						
Trichloroethene	U	1.0						
Trichlorofluoromethane	U	1.0						
Vinyl acetate	U	5.0						
Vinyl chloride	U	1.0						
Surr: 1,2-Dichloroethane-d4	*20.13*	0	*20*	0	*101*	*75-120*	0	
Surr: 4-Bromofluorobenzene	*19.05*	0	*20*	0	*95.2*	*80-110*	0	
Surr: Dibromofluoromethane	*18.61*	0	*20*	0	*93*	*85-115*	0	
Surr: Toluene-d8	*19.94*	0	*20*	0	*99.7*	*85-110*	0	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: BB&E, Inc.
Work Order: 19090657
Project: SSW Collis 2019 LTM Task 3

QC BATCH REPORT

Batch ID: **R271001B** Instrument ID **VMS6** Method: **SW8260C**

LCS Sample ID: **VLCSW1-190920-R271001B** Units: **µg/L** Analysis Date: **9/20/2019 01:33 PM**
Client ID: Run ID: **VMS6_190920A** SeqNo: **5933671** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	19.85	1.0	20	0	99.2	73-114	0			
1,1,1-Trichloroethane	19.27	1.0	20	0	96.4	75-130	0			
1,1,2,2-Tetrachloroethane	20.46	1.0	20	0	102	75-130	0			
1,1,2-Trichloroethane	19.57	1.0	20	0	97.8	75-125	0			
1,1-Dichloroethane	20.77	1.0	20	0	104	68-142	0			
1,1-Dichloroethene	21.61	1.0	20	0	108	70-145	0			
1,1-Dichloropropene	19.59	1.0	20	0	98	75-135	0			
1,2,3-Trichlorobenzene	22.51	1.0	20	0	113	70-140	0			
1,2,3-Trichloropropane	20.09	1.0	20	0	100	75-125	0			
1,2,4-Trichlorobenzene	21.04	1.0	20	0	105	70-135	0			
1,2,4-Trimethylbenzene	18.98	1.0	20	0	94.9	75-130	0			
1,2-Dibromo-3-chloropropane	19.17	1.0	20	0	95.8	60-130	0			
1,2-Dibromoethane	22.16	1.0	20	0	111	67-155	0			
1,2-Dichlorobenzene	19.77	1.0	20	0	98.8	70-130	0			
1,2-Dichloroethane	19.65	1.0	20	0	98.2	78-125	0			
1,2-Dichloropropane	19.94	1.0	20	0	99.7	75-125	0			
1,3,5-Trimethylbenzene	19.14	1.0	20	0	95.7	75-130	0			
1,3-Dichlorobenzene	20.92	1.0	20	0	105	75-130	0			
1,3-Dichloropropane	21.12	1.0	20	0	106	75-125	0			
1,4-Dichlorobenzene	20.17	1.0	20	0	101	75-130	0			
2,2-Dichloropropane	22.89	1.0	20	0	114	43-150	0			
2-Butanone	19.78	5.0	20	0	98.9	55-150	0			
2-Chlorotoluene	19.55	1.0	20	0	97.8	76-117	0			
2-Hexanone	19.15	5.0	20	0	95.8	60-135	0			
4-Chlorotoluene	19.98	1.0	20	0	99.9	80-125	0			
4-Isopropyltoluene	20.26	1.0	20	0	101	61-164	0			
4-Methyl-2-pentanone	25.51	1.0	20	0	128	77-178	0			
Acetone	16.61	10	20	0	83	60-160	0			
Acrylonitrile	18.5	1.0	20	0	92.5	60-140	0			
Benzene	20.03	1.0	20	0	100	70-130	0			
Bromobenzene	20	1.0	20	0	100	80-125	0			
Bromochloromethane	19.99	1.0	20	0	100	72-141	0			
Bromodichloromethane	20.27	1.0	20	0	101	75-125	0			
Bromoform	17.31	1.0	20	0	86.6	60-125	0			
Bromomethane	30.14	1.0	20	0	151	30-185	0			B
Carbon disulfide	20.83	1.0	20	0	104	60-165	0			
Carbon tetrachloride	19.87	1.0	20	0	99.4	65-140	0			
Chlorobenzene	20.81	1.0	20	0	104	80-120	0			
Chloroethane	20.37	1.0	20	0	102	31-172	0			
Chloroform	20.16	1.0	20	0	101	66-135	0			
Chloromethane	25.52	1.0	20	0	128	46-148	0			
cis-1,2-Dichloroethene	21.4	1.0	20	0	107	75-134	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **R271001B**	Instrument ID **VMS6**			Method: **SW8260C**			
cis-1,3-Dichloropropene	20.22	1.0	20	0	101	70-130	0
Dibromochloromethane	18.64	1.0	20	0	93.2	60-115	0
Dibromomethane	21.5	1.0	20	0	108	79-126	0
Dichlorodifluoromethane	23.33	1.0	20	0	117	20-120	0
Ethylbenzene	19.54	1.0	20	0	97.7	76-123	0
Hexachlorobutadiene	25.78	1.0	20	0	129	70-155	0
Hexachloroethane	17.15	1.0	20	0	85.8	50-124	0
Iodomethane	24.64	5.0	20	0	123	60-160	0
Isopropylbenzene	19.16	1.0	20	0	95.8	80-127	0
m,p-Xylene	39.34	2.0	40	0	98.4	75-130	0
Methyl tert-butyl ether	19.43	1.0	20	0	97.2	68-129	0
Methylene chloride	22.44	5.0	20	0	112	72-125	0
Naphthalene	21.05	5.0	20	0	105	55-160	0
n-Butylbenzene	20.75	1.0	20	0	104	75-145	0
n-Propylbenzene	20.22	1.0	20	0	101	76-116	0
o-Xylene	19.99	1.0	20	0	100	76-127	0
p-Isopropyltoluene	20.26	1.0	20	0	101	61-164	0
sec-Butylbenzene	20.45	1.0	20	0	102	80-134	0
Styrene	20.31	1.0	20	0	102	83-137	0
tert-Butyl alcohol	97.19	20	100	0	97.2	70-130	0
tert-Butylbenzene	19.88	1.0	20	0	99.4	70-130	0
Tetrachloroethene	21.45	1.0	20	0	107	68-166	0
Tetrahydrofuran	20.36	1.0	20	0	102	54-139	0
Toluene	20.11	1.0	20	0	101	76-125	0
trans-1,2-Dichloroethene	21.9	1.0	20	0	110	80-140	0
trans-1,3-Dichloropropene	19.77	1.0	20	0	98.8	56-132	0
trans-1,4-Dichloro-2-butene	13.39	2.0	20	0	67	46-118	0
Trichloroethene	20.07	1.0	20	0	100	77-125	0
Trichlorofluoromethane	18.46	1.0	20	0	92.3	60-140	0
Vinyl chloride	21.3	1.0	20	0	106	50-136	0
Surr: 1,2-Dichloroethane-d4	*20.36*	0	*20*	0	*102*	*75-120*	0
Surr: 4-Bromofluorobenzene	*19.29*	0	*20*	0	*96.4*	*80-110*	0
Surr: Dibromofluoromethane	*19.26*	0	*20*	0	*96.3*	*85-115*	0
Surr: Toluene-d8	*20.03*	0	*20*	0	*100*	*85-110*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: BB&E, Inc.
Work Order: 19090657
Project: SSW Collis 2019 LTM Task 3

QC BATCH REPORT

Batch ID: **R271001B** Instrument ID **VMS6** Method: **SW8260C**

MS Sample ID: **19090657-14A MS** Units: **µg/L** Analysis Date: **9/20/2019 11:09 PM**
Client ID: **COL-GW-14** Run ID: **VMS6_190920A** SeqNo: **5933688** Prep Date: DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	81.45	5.0	100	0	81.4	73-114	0			
1,1,1-Trichloroethane	87.95	5.0	100	0	88	75-130	0			
1,1,2,2-Tetrachloroethane	91.05	5.0	100	0	91	75-130	0			
1,1,2-Trichloroethane	88.8	5.0	100	0	88.8	75-125	0			
1,1-Dichloroethane	92.15	5.0	100	0	92.2	68-142	0			
1,1-Dichloroethene	105.5	5.0	100	1.7	104	70-145	0			
1,1-Dichloropropene	86.45	5.0	100	0	86.4	75-135	0			
1,2,3-Trichlorobenzene	91.5	5.0	100	0	91.5	70-140	0			
1,2,3-Trichloropropane	92.8	5.0	100	0	92.8	75-125	0			
1,2,4-Trichlorobenzene	88.8	5.0	100	0	88.8	70-135	0			
1,2,4-Trimethylbenzene	85.1	5.0	100	0	85.1	75-130	0			
1,2-Dibromo-3-chloropropane	86.2	5.0	100	0	86.2	60-130	0			
1,2-Dibromoethane	91.25	5.0	100	0	91.2	67-155	0			
1,2-Dichlorobenzene	85.6	5.0	100	0	85.6	70-130	0			
1,2-Dichloroethane	82.65	5.0	100	0	82.6	78-125	0			
1,2-Dichloropropane	86.6	5.0	100	0	86.6	75-125	0			
1,3,5-Trimethylbenzene	84.4	5.0	100	0	84.4	75-130	0			
1,3-Dichlorobenzene	87.15	5.0	100	0	87.2	75-130	0			
1,3-Dichloropropane	90.85	5.0	100	0	90.8	75-125	0			
1,4-Dichlorobenzene	85.45	5.0	100	0	85.4	75-130	0			
2,2-Dichloropropane	81.4	5.0	100	0	81.4	43-150	0			
2-Butanone	92.05	25	100	0	92	55-150	0			
2-Chlorotoluene	89.65	5.0	100	0	89.6	76-117	0			
2-Hexanone	93.5	25	100	0	93.5	60-135	0			
4-Chlorotoluene	90.3	5.0	100	0	90.3	80-125	0			
4-Isopropyltoluene	86.4	5.0	100	0	86.4	61-164	0			
4-Methyl-2-pentanone	117.8	5.0	100	0	118	77-178	0			
Acetone	93.3	50	100	6.4	86.9	60-160	0			
Acrylonitrile	85.6	5.0	100	0	85.6	60-140	0			
Benzene	89.35	5.0	100	0	89.4	70-130	0			
Bromobenzene	86.95	5.0	100	0	87	80-125	0			
Bromochloromethane	85.85	5.0	100	0	85.8	72-141	0			
Bromodichloromethane	85	5.0	100	0	85	75-125	0			
Bromoform	71.4	5.0	100	0	71.4	60-125	0			
Bromomethane	89.45	5.0	100	0	89.4	30-185	0			B
Carbon disulfide	84.15	5.0	100	0	84.2	60-165	0			
Carbon tetrachloride	90.2	5.0	100	0	90.2	65-140	0			
Chlorobenzene	88.7	5.0	100	0	88.7	80-120	0			
Chloroethane	106.8	5.0	100	0	107	31-172	0			
Chloroform	87.95	5.0	100	0	88	66-135	0			
Chloromethane	108.4	5.0	100	0	108	46-148	0			
cis-1,2-Dichloroethene	319.2	5.0	100	233	86.2	75-134	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: BB&E, Inc.
Work Order: 19090657
Project: SSW Collis 2019 LTM Task 3

QC BATCH REPORT

Batch ID: **R271001B** Instrument ID **VMS6** Method: **SW8260C**

cis-1,3-Dichloropropene	82	5.0	100	0	82	70-130	0	
Dibromochloromethane	74.7	5.0	100	0	74.7	60-115	0	
Dibromomethane	90.4	5.0	100	0	90.4	79-126	0	
Dichlorodifluoromethane	126	5.0	100	0	126	20-120	0	S
Ethylbenzene	86.65	5.0	100	0	86.6	76-123	0	
Hexachlorobutadiene	125.8	5.0	100	0	126	70-155	0	
Hexachloroethane	63.4	5.0	100	0	63.4	50-124	0	
Iodomethane	77.2	25	100	3.4	73.8	60-160	0	
Isopropylbenzene	88.65	5.0	100	0	88.6	80-127	0	
m,p-Xylene	174	10	200	0	87	75-130	0	
Methyl tert-butyl ether	84.4	5.0	100	0	84.4	68-129	0	
Methylene chloride	100.1	25	100	0	100	72-125	0	
Naphthalene	95.05	25	100	0	95	55-160	0	
n-Butylbenzene	87.05	5.0	100	0	87	75-145	0	
n-Propylbenzene	90.65	5.0	100	0	90.6	76-116	0	
o-Xylene	90.1	5.0	100	0	90.1	76-127	0	
p-Isopropyltoluene	86.4	5.0	100	0	86.4	61-164	0	
sec-Butylbenzene	92.15	5.0	100	0	92.2	80-134	0	
Styrene	88.5	5.0	100	0	88.5	83-137	0	
tert-Butyl alcohol	434.1	100	500	0	86.8	70-130	0	
tert-Butylbenzene	89.05	5.0	100	0	89	70-130	0	
Tetrachloroethene	91.85	5.0	100	0	91.8	68-166	0	
Tetrahydrofuran	99.75	5.0	100	0	99.8	54-139	0	
Toluene	90.8	5.0	100	0	90.8	76-125	0	
trans-1,2-Dichloroethene	107.9	5.0	100	11.4	96.5	80-140	0	
trans-1,3-Dichloropropene	75.75	5.0	100	0	75.8	56-132	0	
trans-1,4-Dichloro-2-butene	52	10	100	0	52	46-118	0	
Trichloroethene	95.35	5.0	100	0	95.4	77-125	0	
Trichlorofluoromethane	95.25	5.0	100	0	95.2	60-140	0	
Vinyl chloride	212	5.0	100	110.7	101	50-136	0	
Surr: 1,2-Dichloroethane-d4	*99.65*	0	*100*	0	*99.6*	*75-120*	0	
Surr: 4-Bromofluorobenzene	*98.95*	0	*100*	0	*99*	*80-110*	0	
Surr: Dibromofluoromethane	*94.85*	0	*100*	0	*94.8*	*85-115*	0	
Surr: Toluene-d8	*97.25*	0	*100*	0	*97.2*	*85-110*	0	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: BB&E, Inc.
Work Order: 19090657
Project: SSW Collis 2019 LTM Task 3

QC BATCH REPORT

Batch ID: **R271001B** Instrument ID **VMS6** Method: **SW8260C**

MSD Sample ID: **19090657-14A MSD** Units: **µg/L** Analysis Date: **9/20/2019 11:34 PM**
Client ID: **COL-GW-14** Run ID: **VMS6_190920A** SeqNo: **5933689** Prep Date: DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	74.5	5.0	100	0	74.5	73-114	81.45	8.91	30	
1,1,1-Trichloroethane	76.85	5.0	100	0	76.8	75-130	87.95	13.5	30	
1,1,2,2-Tetrachloroethane	91.7	5.0	100	0	91.7	75-130	91.05	0.711	30	
1,1,2-Trichloroethane	79.2	5.0	100	0	79.2	75-125	88.8	11.4	30	
1,1-Dichloroethane	83.4	5.0	100	0	83.4	68-142	92.15	9.97	30	
1,1-Dichloroethene	94.75	5.0	100	1.7	93	70-145	105.5	10.7	30	
1,1-Dichloropropene	78.9	5.0	100	0	78.9	75-135	86.45	9.13	30	
1,2,3-Trichlorobenzene	91.7	5.0	100	0	91.7	70-140	91.5	0.218	30	
1,2,3-Trichloropropane	86.1	5.0	100	0	86.1	75-125	92.8	7.49	30	
1,2,4-Trichlorobenzene	83.9	5.0	100	0	83.9	70-135	88.8	5.67	30	
1,2,4-Trimethylbenzene	77	5.0	100	0	77	75-130	85.1	9.99	30	
1,2-Dibromo-3-chloropropane	82.45	5.0	100	0	82.4	60-130	86.2	4.45	30	
1,2-Dibromoethane	88.65	5.0	100	0	88.6	67-155	91.25	2.89	30	
1,2-Dichlorobenzene	81.25	5.0	100	0	81.2	70-130	85.6	5.21	30	
1,2-Dichloroethane	76.2	5.0	100	0	76.2	78-125	82.65	8.12	30	S
1,2-Dichloropropane	81.1	5.0	100	0	81.1	75-125	86.6	6.56	30	
1,3,5-Trimethylbenzene	77.15	5.0	100	0	77.2	75-130	84.4	8.98	30	
1,3-Dichlorobenzene	83.4	5.0	100	0	83.4	75-130	87.15	4.4	30	
1,3-Dichloropropane	83	5.0	100	0	83	75-125	90.85	9.03	30	
1,4-Dichlorobenzene	80.4	5.0	100	0	80.4	75-130	85.45	6.09	30	
2,2-Dichloropropane	69.85	5.0	100	0	69.8	43-150	81.4	15.3	30	
2-Butanone	95.25	25	100	0	95.2	55-150	92.05	3.42	30	
2-Chlorotoluene	81.1	5.0	100	0	81.1	76-117	89.65	10	30	
2-Hexanone	89.55	25	100	0	89.6	60-135	93.5	4.32	30	
4-Chlorotoluene	80.35	5.0	100	0	80.4	80-125	90.3	11.7	30	
4-Isopropyltoluene	78.6	5.0	100	0	78.6	61-164	86.4	9.45	30	
4-Methyl-2-pentanone	111	5.0	100	0	111	77-178	117.8	5.94	30	
Acetone	96.4	50	100	6.4	90	60-160	93.3	3.27	30	
Acrylonitrile	87.35	5.0	100	0	87.4	60-140	85.6	2.02	30	
Benzene	80.1	5.0	100	0	80.1	70-130	89.35	10.9	30	
Bromobenzene	77.9	5.0	100	0	77.9	80-125	86.95	11	30	S
Bromochloromethane	80.65	5.0	100	0	80.6	72-141	85.85	6.25	30	
Bromodichloromethane	78.05	5.0	100	0	78	75-125	85	8.52	30	
Bromoform	67.05	5.0	100	0	67	60-125	71.4	6.28	30	
Bromomethane	104.6	5.0	100	0	105	30-185	89.45	15.6	30	B
Carbon disulfide	75.5	5.0	100	0	75.5	60-165	84.15	10.8	30	
Carbon tetrachloride	79	5.0	100	0	79	65-140	90.2	13.2	30	
Chlorobenzene	80.75	5.0	100	0	80.8	80-120	88.7	9.38	30	
Chloroethane	90.4	5.0	100	0	90.4	31-172	106.8	16.6	30	
Chloroform	82.05	5.0	100	0	82	66-135	87.95	6.94	30	
Chloromethane	108.9	5.0	100	0	109	46-148	108.4	0.506	30	
cis-1,2-Dichloroethene	288	5.0	100	233	55	75-134	319.2	10.3	30	S

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: BB&E, Inc.
Work Order: 19090657
Project: SSW Collis 2019 LTM Task 3

QC BATCH REPORT

Batch ID: **R271001B**	Instrument ID **VMS6**			Method: **SW8260C**						
cis-1,3-Dichloropropene	75.35	5.0	100	0	75.4	70-130	82	8.45	30	
Dibromochloromethane	70.8	5.0	100	0	70.8	60-115	74.7	5.36	30	
Dibromomethane	86.6	5.0	100	0	86.6	79-126	90.4	4.29	30	
Dichlorodifluoromethane	110.9	5.0	100	0	111	20-120	126	12.8	30	
Ethylbenzene	75.75	5.0	100	0	75.8	76-123	86.65	13.4	30	S
Hexachlorobutadiene	120.4	5.0	100	0	120	70-155	125.8	4.39	30	
Hexachloroethane	58.9	5.0	100	0	58.9	50-124	63.4	7.36	30	
Iodomethane	91.8	25	100	3.4	88.4	60-160	77.2	17.3	30	
Isopropylbenzene	79.6	5.0	100	0	79.6	80-127	88.65	10.8	30	S
m,p-Xylene	154.9	10	200	0	77.4	75-130	174	11.6	30	
Methyl tert-butyl ether	83.25	5.0	100	0	83.2	68-129	84.4	1.37	30	
Methylene chloride	90.4	25	100	0	90.4	72-125	100.1	10.2	30	
Naphthalene	96.6	25	100	0	96.6	55-160	95.05	1.62	30	
n-Butylbenzene	80.75	5.0	100	0	80.8	75-145	87.05	7.51	30	
n-Propylbenzene	80.85	5.0	100	0	80.8	76-116	90.65	11.4	30	
o-Xylene	79.2	5.0	100	0	79.2	76-127	90.1	12.9	30	
p-Isopropyltoluene	78.6	5.0	100	0	78.6	61-164	86.4	9.45	30	
sec-Butylbenzene	83.1	5.0	100	0	83.1	80-134	92.15	10.3	30	
Styrene	78.45	5.0	100	0	78.4	83-137	88.5	12	30	S
tert-Butyl alcohol	382.4	100	500	0	76.5	70-130	434.1	12.7	30	
tert-Butylbenzene	80.05	5.0	100	0	80	70-130	89.05	10.6	30	
Tetrachloroethene	83.9	5.0	100	0	83.9	68-166	91.85	9.05	30	
Tetrahydrofuran	92.95	5.0	100	0	93	54-139	99.75	7.06	30	
Toluene	79.45	5.0	100	0	79.4	76-125	90.8	13.3	30	
trans-1,2-Dichloroethene	94.6	5.0	100	11.4	83.2	80-140	107.9	13.1	30	
trans-1,3-Dichloropropene	69.95	5.0	100	0	70	56-132	75.75	7.96	30	
trans-1,4-Dichloro-2-butene	46.55	10	100	0	46.6	46-118	52	11.1	30	
Trichloroethene	83.2	5.0	100	0	83.2	77-125	95.35	13.6	30	
Trichlorofluoromethane	82.5	5.0	100	0	82.5	60-140	95.25	14.3	30	
Vinyl chloride	188.9	5.0	100	110.7	78.2	50-136	212	11.5	30	
Surr: 1,2-Dichloroethane-d4	*97.95*	0	*100*	0	*98*	*75-120*	99.65	*1.72*	*30*	
Surr: 4-Bromofluorobenzene	*97.9*	0	*100*	0	*97.9*	*80-110*	98.95	*1.07*	*30*	
Surr: Dibromofluoromethane	*95.85*	0	*100*	0	*95.8*	*85-115*	94.85	*1.05*	*30*	
Surr: Toluene-d8	*97.9*	0	*100*	0	*97.9*	*85-110*	97.25	*0.666*	*30*	

The following samples were analyzed in this batch: 19090657-08A, 19090657-12A, 19090657-13A, 19090657-14A, 19090657-15A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: BB&E, Inc.
Work Order: 19090657
Project: SSW Collis 2019 LTM Task 3

QC BATCH REPORT

Batch ID: **R271003** Instrument ID **VMS11** Method: **SW8260C**

MBLK Sample ID: **VBLKW2-190919-R271003** Units: **µg/L** Analysis Date: **9/20/2019 02:33 AM**
Client ID: Run ID: **VMS11_190919A** SeqNo: **5932628** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	U	1.0								
1,1,1-Trichloroethane	U	1.0								
1,1,2,2-Tetrachloroethane	U	1.0								
1,1,2-Trichloroethane	U	1.0								
1,1,2-Trichlorotrifluoroethane	U	1.0								
1,1-Dichloroethane	U	1.0								
1,1-Dichloroethene	U	1.0								
1,1-Dichloropropene	U	1.0								
1,2,3-Trichlorobenzene	U	1.0								
1,2,3-Trichloropropane	U	1.0								
1,2,4-Trichlorobenzene	U	1.0								
1,2,4-Trimethylbenzene	U	1.0								
1,2-Dibromo-3-chloropropane	U	1.0								
1,2-Dibromoethane	U	1.0								
1,2-Dichlorobenzene	U	1.0								
1,2-Dichloroethane	U	1.0								
1,2-Dichloropropane	U	1.0								
1,3,5-Trichlorobenzene	U	1.0								
1,3,5-Trimethylbenzene	U	1.0								
1,3-Dichlorobenzene	U	1.0								
1,3-Dichloropropane	U	1.0								
1,4-Dichlorobenzene	U	1.0								
2,2-Dichloropropane	U	1.0								
2-Butanone	U	5.0								
2-Chloroethyl vinyl ether	U	1.0								
2-Chlorotoluene	U	1.0								
2-Hexanone	U	5.0								
2-Methylnaphthalene	U	5.0								
4-Chlorotoluene	U	1.0								
4-Isopropyltoluene	U	1.0								
4-Methyl-2-pentanone	U	1.0								
Acetone	U	10								
Acrolein	U	1.0								
Acrylonitrile	U	1.0								
Benzene	U	1.0								
Benzyl chloride	U	1.0								
Bromobenzene	U	1.0								
Bromochloromethane	U	1.0								
Bromodichloromethane	U	1.0								
Bromoform	U	1.0								
Bromomethane	U	1.0								
Carbon disulfide	U	1.0								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **R271003** Instrument ID **VMS11** Method: **SW8260C**

Carbon tetrachloride	U	1.0						
Chlorobenzene	U	1.0						
Chloroethane	U	1.0						
Chloroform	U	1.0						
Chloromethane	U	1.0						
cis-1,2-Dichloroethene	U	1.0						
cis-1,3-Dichloropropene	U	1.0						
Dibromochloromethane	U	1.0						
Dibromomethane	U	1.0						
Dichlorodifluoromethane	U	1.0						
Ethylbenzene	U	1.0						
Hexachlorobutadiene	U	1.0						
Hexachloroethane	U	1.0						
Hexane	U	1.0						
Iodomethane	U	5.0						
Isopropylbenzene	U	1.0						
m,p-Xylene	U	2.0						
Methyl tert-butyl ether	U	1.0						
Methylene chloride	U	5.0						
Naphthalene	U	5.0						
n-Butylbenzene	U	1.0						
n-Propylbenzene	U	1.0						
o-Xylene	U	1.0						
p-Isopropyltoluene	U	1.0						
sec-Butylbenzene	U	1.0						
Styrene	U	1.0						
tert-Butyl alcohol	U	20						
tert-Butylbenzene	U	1.0						
Tetrachloroethene	U	1.0						
Tetrahydrofuran	U	1.0						
Toluene	U	1.0						
trans-1,2-Dichloroethene	U	1.0						
trans-1,3-Dichloropropene	0.55	1.0						J
trans-1,4-Dichloro-2-butene	U	2.0						
Trichloroethene	U	1.0						
Trichlorofluoromethane	U	1.0						
Vinyl acetate	U	5.0						
Vinyl chloride	U	1.0						
Surr: 1,2-Dichloroethane-d4	*20.54*	0	*20*	0	*103*	*75-120*	0	
Surr: 4-Bromofluorobenzene	*19.03*	0	*20*	0	*95.2*	*80-110*	0	
Surr: Dibromofluoromethane	*20.04*	0	*20*	0	*100*	*85-115*	0	
Surr: Toluene-d8	*19.66*	0	*20*	0	*98.3*	*85-110*	0	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: BB&E, Inc.
Work Order: 19090657
Project: SSW Collis 2019 LTM Task 3

QC BATCH REPORT

Batch ID: **R271003** Instrument ID **VMS11** Method: **SW8260C**

LCS Sample ID: **VLCSW2-190919-R271003** Units: **µg/L** Analysis Date: **9/20/2019 01:27 AM**
Client ID: Run ID: **VMS11_190919A** SeqNo: **5932627** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	18.37	1.0	20	0	91.8	73-114	0			
1,1,1-Trichloroethane	21.5	1.0	20	0	108	75-130	0			
1,1,2,2-Tetrachloroethane	19.74	1.0	20	0	98.7	75-130	0			
1,1,2-Trichloroethane	18.59	1.0	20	0	93	75-125	0			
1,1-Dichloroethane	19.06	1.0	20	0	95.3	68-142	0			
1,1-Dichloroethene	22.6	1.0	20	0	113	70-145	0			
1,1-Dichloropropene	19.45	1.0	20	0	97.2	75-135	0			
1,2,3-Trichlorobenzene	19.82	1.0	20	0	99.1	70-140	0			
1,2,3-Trichloropropane	18.62	1.0	20	0	93.1	75-125	0			
1,2,4-Trichlorobenzene	18.36	1.0	20	0	91.8	70-135	0			
1,2,4-Trimethylbenzene	18.57	1.0	20	0	92.8	75-130	0			
1,2-Dibromo-3-chloropropane	18.9	1.0	20	0	94.5	60-130	0			
1,2-Dibromoethane	19.38	1.0	20	0	96.9	67-155	0			
1,2-Dichlorobenzene	19.77	1.0	20	0	98.8	70-130	0			
1,2-Dichloroethane	18.47	1.0	20	0	92.4	78-125	0			
1,2-Dichloropropane	19.34	1.0	20	0	96.7	75-125	0			
1,3,5-Trimethylbenzene	19.49	1.0	20	0	97.4	75-130	0			
1,3-Dichlorobenzene	19.79	1.0	20	0	99	75-130	0			
1,3-Dichloropropane	18.02	1.0	20	0	90.1	75-125	0			
1,4-Dichlorobenzene	19.4	1.0	20	0	97	75-130	0			
2,2-Dichloropropane	17.64	1.0	20	0	88.2	43-150	0			
2-Butanone	19.19	5.0	20	0	96	55-150	0			
2-Chlorotoluene	19.51	1.0	20	0	97.6	76-117	0			
2-Hexanone	16.82	5.0	20	0	84.1	60-135	0			
4-Chlorotoluene	18.97	1.0	20	0	94.8	80-125	0			
4-Isopropyltoluene	20.72	1.0	20	0	104	61-164	0			
4-Methyl-2-pentanone	20.37	1.0	20	0	102	77-178	0			
Acetone	18.25	10	20	0	91.2	60-160	0			
Acrylonitrile	16.86	1.0	20	0	84.3	60-140	0			
Benzene	18.76	1.0	20	0	93.8	70-130	0			
Bromobenzene	19.47	1.0	20	0	97.4	80-125	0			
Bromochloromethane	18.86	1.0	20	0	94.3	72-141	0			
Bromodichloromethane	21.69	1.0	20	0	108	75-125	0			
Bromoform	17.65	1.0	20	0	88.2	60-125	0			
Bromomethane	19.24	1.0	20	0	96.2	30-185	0			
Carbon disulfide	23.65	1.0	20	0	118	60-165	0			
Carbon tetrachloride	21.12	1.0	20	0	106	65-140	0			
Chlorobenzene	18.61	1.0	20	0	93	80-120	0			
Chloroethane	18.59	1.0	20	0	93	31-172	0			
Chloroform	19.21	1.0	20	0	96	66-135	0			
Chloromethane	19.16	1.0	20	0	95.8	46-148	0			
cis-1,2-Dichloroethene	19.58	1.0	20	0	97.9	75-134	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **R271003** Instrument ID **VMS11** Method: **SW8260C**

cis-1,3-Dichloropropene	19.4	1.0	20	0	97	70-130	0	
Dibromochloromethane	16.44	1.0	20	0	82.2	60-115	0	
Dibromomethane	19.93	1.0	20	0	99.6	79-126	0	
Dichlorodifluoromethane	26.28	1.0	20	0	131	20-120	0	S
Ethylbenzene	19.3	1.0	20	0	96.5	76-123	0	
Hexachlorobutadiene	19.28	1.0	20	0	96.4	70-155	0	
Hexachloroethane	17.49	1.0	20	0	87.4	50-124	0	
Iodomethane	20.42	5.0	20	0	102	60-160	0	
Isopropylbenzene	19.9	1.0	20	0	99.5	80-127	0	
m,p-Xylene	38.4	2.0	40	0	96	75-130	0	
Methyl tert-butyl ether	18.7	1.0	20	0	93.5	68-129	0	
Methylene chloride	20.2	5.0	20	0	101	72-125	0	
Naphthalene	19.16	5.0	20	0	95.8	55-160	0	
n-Butylbenzene	21.08	1.0	20	0	105	75-145	0	
n-Propylbenzene	19.68	1.0	20	0	98.4	76-116	0	
o-Xylene	19.19	1.0	20	0	96	76-127	0	
p-Isopropyltoluene	20.72	1.0	20	0	104	61-164	0	
sec-Butylbenzene	20.14	1.0	20	0	101	80-134	0	
Styrene	19.65	1.0	20	0	98.2	83-137	0	
tert-Butyl alcohol	115	20	100	0	115	70-130	0	
tert-Butylbenzene	19.21	1.0	20	0	96	70-130	0	
Tetrachloroethene	19.45	1.0	20	0	97.2	68-166	0	
Tetrahydrofuran	15.78	1.0	20	0	78.9	54-139	0	
Toluene	18.26	1.0	20	0	91.3	76-125	0	
trans-1,2-Dichloroethene	20.73	1.0	20	0	104	80-140	0	
trans-1,3-Dichloropropene	17	1.0	20	0	85	56-132	0	
trans-1,4-Dichloro-2-butene	13.17	2.0	20	0	65.8	46-118	0	
Trichloroethene	19.05	1.0	20	0	95.2	77-125	0	
Trichlorofluoromethane	19.15	1.0	20	0	95.8	60-140	0	
Vinyl chloride	20.16	1.0	20	0	101	50-136	0	
Surr: 1,2-Dichloroethane-d4	*20.02*	0	*20*	0	*100*	*75-120*	0	
Surr: 4-Bromofluorobenzene	*19.89*	0	*20*	0	*99.4*	*80-110*	0	
Surr: Dibromofluoromethane	*21.06*	0	*20*	0	*105*	*85-115*	0	
Surr: Toluene-d8	*20.02*	0	*20*	0	*100*	*85-110*	0	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: BB&E, Inc.
Work Order: 19090657
Project: SSW Collis 2019 LTM Task 3

QC BATCH REPORT

Batch ID: **R271003** Instrument ID **VMS11** Method: **SW8260C**

MS Sample ID: **19090657-05A MS** Units: **µg/L** Analysis Date: **9/20/2019 10:40 AM**
Client ID: **COL-GW-05** Run ID: **VMS11_190919A** SeqNo: **5932649** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	17.63	1.0	20	0	88.2	73-114	0			
1,1,1-Trichloroethane	20.53	1.0	20	0	103	75-130	0			
1,1,2,2-Tetrachloroethane	19.83	1.0	20	0	99.2	75-130	0			
1,1,2-Trichloroethane	19.33	1.0	20	0	96.6	75-125	0			
1,1-Dichloroethane	20.18	1.0	20	0	101	68-142	0			
1,1-Dichloroethene	22.95	1.0	20	0	115	70-145	0			
1,1-Dichloropropene	19.54	1.0	20	0	97.7	75-135	0			
1,2,3-Trichlorobenzene	17.79	1.0	20	0	89	70-140	0			
1,2,3-Trichloropropane	17.87	1.0	20	0	89.4	75-125	0			
1,2,4-Trichlorobenzene	17.29	1.0	20	0	86.4	70-135	0			
1,2,4-Trimethylbenzene	17.94	1.0	20	0	89.7	75-130	0			
1,2-Dibromo-3-chloropropane	16.18	1.0	20	0	80.9	60-130	0			
1,2-Dibromoethane	19.93	1.0	20	0	99.6	67-155	0			
1,2-Dichlorobenzene	19.4	1.0	20	0	97	70-130	0			
1,2-Dichloroethane	19.77	1.0	20	0	98.8	78-125	0			
1,2-Dichloropropane	20.39	1.0	20	0	102	75-125	0			
1,3,5-Trimethylbenzene	18.52	1.0	20	0	92.6	75-130	0			
1,3-Dichlorobenzene	18.49	1.0	20	0	92.4	75-130	0			
1,3-Dichloropropane	18.83	1.0	20	0	94.2	75-125	0			
1,4-Dichlorobenzene	18.49	1.0	20	0	92.4	75-130	0			
2,2-Dichloropropane	13.04	1.0	20	0	65.2	43-150	0			
2-Butanone	21.94	5.0	20	0.87	105	55-150	0			
2-Chlorotoluene	18.94	1.0	20	0	94.7	76-117	0			
2-Hexanone	17.53	5.0	20	0	87.6	60-135	0			
4-Chlorotoluene	18.37	1.0	20	0	91.8	80-125	0			
4-Isopropyltoluene	18.59	1.0	20	0	93	61-164	0			
4-Methyl-2-pentanone	19.9	1.0	20	0	99.5	77-178	0			
Acetone	24.37	10	20	10.6	68.8	60-160	0			
Acrylonitrile	17.57	1.0	20	0	87.8	60-140	0			
Benzene	20.04	1.0	20	0	100	70-130	0			
Bromobenzene	19.36	1.0	20	0	96.8	80-125	0			
Bromochloromethane	19.67	1.0	20	0	98.4	72-141	0			
Bromodichloromethane	20.36	1.0	20	0	102	75-125	0			
Bromoform	15.52	1.0	20	0	77.6	60-125	0			
Bromomethane	8.58	1.0	20	0	42.9	30-185	0			
Carbon disulfide	21.2	1.0	20	0	106	60-165	0			
Carbon tetrachloride	19.35	1.0	20	0	96.8	65-140	0			
Chlorobenzene	18.98	1.0	20	0	94.9	80-120	0			
Chloroethane	21.02	1.0	20	0	105	31-172	0			
Chloroform	20.89	1.0	20	0	104	66-135	0			
Chloromethane	20.9	1.0	20	0.49	102	46-148	0			
cis-1,2-Dichloroethene	31.47	1.0	20	11.24	101	75-134	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: BB&E, Inc.
Work Order: 19090657
Project: SSW Collis 2019 LTM Task 3

QC BATCH REPORT

Batch ID: **R271003** Instrument ID **VMS11** Method: **SW8260C**

cis-1,3-Dichloropropene	17.2	1.0	20	0	86	70-130	0	
Dibromochloromethane	15.28	1.0	20	0	76.4	60-115	0	
Dibromomethane	20.61	1.0	20	0	103	79-126	0	
Dichlorodifluoromethane	24.12	1.0	20	0	121	20-120	0	S
Ethylbenzene	18.65	1.0	20	0	93.2	76-123	0	
Hexachlorobutadiene	15.45	1.0	20	0	77.2	70-155	0	
Hexachloroethane	13.59	1.0	20	0	68	50-124	0	
Iodomethane	8.39	5.0	20	0	42	60-160	0	S
Isopropylbenzene	18.63	1.0	20	0	93.2	80-127	0	
m,p-Xylene	37.04	2.0	40	0	92.6	75-130	0	
Methyl tert-butyl ether	19.37	1.0	20	0	96.8	68-129	0	
Methylene chloride	21.99	5.0	20	0	110	72-125	0	
Naphthalene	16.52	5.0	20	0	82.6	55-160	0	
n-Butylbenzene	18.06	1.0	20	0	90.3	75-145	0	
n-Propylbenzene	17.79	1.0	20	0	89	76-116	0	
o-Xylene	18.94	1.0	20	0	94.7	76-127	0	
p-Isopropyltoluene	18.59	1.0	20	0	93	61-164	0	
sec-Butylbenzene	17.94	1.0	20	0	89.7	80-134	0	
Styrene	19.71	1.0	20	0	98.6	83-137	0	
tert-Butyl alcohol	86.23	20	100	13.75	72.5	70-130	0	
tert-Butylbenzene	17.68	1.0	20	0	88.4	70-130	0	
Tetrachloroethene	18.22	1.0	20	0	91.1	68-166	0	
Tetrahydrofuran	15.54	1.0	20	0	77.7	54-139	0	
Toluene	18.51	1.0	20	0	92.6	76-125	0	
trans-1,2-Dichloroethene	22.74	1.0	20	0.56	111	80-140	0	
trans-1,3-Dichloropropene	14.72	1.0	20	0	73.6	56-132	0	
trans-1,4-Dichloro-2-butene	9.49	2.0	20	0	47.4	46-118	0	
Trichloroethene	19.5	1.0	20	0	97.5	77-125	0	
Trichlorofluoromethane	18.23	1.0	20	0	91.2	60-140	0	
Vinyl chloride	22.14	1.0	20	0	111	50-136	0	
Surr: 1,2-Dichloroethane-d4	*20.73*	0	*20*	0	*104*	*75-120*	0	
Surr: 4-Bromofluorobenzene	*20.05*	0	*20*	0	*100*	*80-110*	0	
Surr: Dibromofluoromethane	*20.68*	0	*20*	0	*103*	*85-115*	0	
Surr: Toluene-d8	*19.96*	0	*20*	0	*99.8*	*85-110*	0	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: BB&E, Inc.
Work Order: 19090657
Project: SSW Collis 2019 LTM Task 3

QC BATCH REPORT

Batch ID: **R271003** Instrument ID **VMS11** Method: **SW8260C**

MSD Sample ID: **19090657-05A MSD** Units: **µg/L** Analysis Date: **9/20/2019 11:02 AM**
Client ID: **COL-GW-05** Run ID: **VMS11_190919A** SeqNo: **5932650** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	18.17	1.0	20	0	90.8	73-114	17.63	3.02	30	
1,1,1-Trichloroethane	21.16	1.0	20	0	106	75-130	20.53	3.02	30	
1,1,2,2-Tetrachloroethane	20.05	1.0	20	0	100	75-130	19.83	1.1	30	
1,1,2-Trichloroethane	19.46	1.0	20	0	97.3	75-125	19.33	0.67	30	
1,1-Dichloroethane	20	1.0	20	0	100	68-142	20.18	0.896	30	
1,1-Dichloroethene	22.37	1.0	20	0	112	70-145	22.95	2.56	30	
1,1-Dichloropropene	19.06	1.0	20	0	95.3	75-135	19.54	2.49	30	
1,2,3-Trichlorobenzene	19.43	1.0	20	0	97.2	70-140	17.79	8.81	30	
1,2,3-Trichloropropane	19.34	1.0	20	0	96.7	75-125	17.87	7.9	30	
1,2,4-Trichlorobenzene	17.68	1.0	20	0	88.4	70-135	17.29	2.23	30	
1,2,4-Trimethylbenzene	17.8	1.0	20	0	89	75-130	17.94	0.783	30	
1,2-Dibromo-3-chloropropane	17.3	1.0	20	0	86.5	60-130	16.18	6.69	30	
1,2-Dibromoethane	19.37	1.0	20	0	96.8	67-155	19.93	2.85	30	
1,2-Dichlorobenzene	19.33	1.0	20	0	96.6	70-130	19.4	0.361	30	
1,2-Dichloroethane	19.71	1.0	20	0	98.6	78-125	19.77	0.304	30	
1,2-Dichloropropane	20.81	1.0	20	0	104	75-125	20.39	2.04	30	
1,3,5-Trimethylbenzene	18.34	1.0	20	0	91.7	75-130	18.52	0.977	30	
1,3-Dichlorobenzene	18.89	1.0	20	0	94.4	75-130	18.49	2.14	30	
1,3-Dichloropropane	18.79	1.0	20	0	94	75-125	18.83	0.213	30	
1,4-Dichlorobenzene	19.42	1.0	20	0	97.1	75-130	18.49	4.91	30	
2,2-Dichloropropane	12.8	1.0	20	0	64	43-150	13.04	1.86	30	
2-Butanone	20.65	5.0	20	0.87	98.9	55-150	21.94	6.06	30	
2-Chlorotoluene	18.85	1.0	20	0	94.2	76-117	18.94	0.476	30	
2-Hexanone	17.39	5.0	20	0	87	60-135	17.53	0.802	30	
4-Chlorotoluene	18.07	1.0	20	0	90.4	80-125	18.37	1.65	30	
4-Isopropyltoluene	18.56	1.0	20	0	92.8	61-164	18.59	0.162	30	
4-Methyl-2-pentanone	19.95	1.0	20	0	99.8	77-178	19.9	0.251	30	
Acetone	23.57	10	20	10.6	64.8	60-160	24.37	3.34	30	
Acrylonitrile	17.07	1.0	20	0	85.4	60-140	17.57	2.89	30	
Benzene	19.75	1.0	20	0	98.8	70-130	20.04	1.46	30	
Bromobenzene	18.91	1.0	20	0	94.6	80-125	19.36	2.35	30	
Bromochloromethane	18.77	1.0	20	0	93.8	72-141	19.67	4.68	30	
Bromodichloromethane	20.78	1.0	20	0	104	75-125	20.36	2.04	30	
Bromoform	15.39	1.0	20	0	77	60-125	15.52	0.841	30	
Bromomethane	9.78	1.0	20	0	48.9	30-185	8.58	13.1	30	
Carbon disulfide	21.53	1.0	20	0	108	60-165	21.2	1.54	30	
Carbon tetrachloride	20.21	1.0	20	0	101	65-140	19.35	4.35	30	
Chlorobenzene	18.6	1.0	20	0	93	80-120	18.98	2.02	30	
Chloroethane	20.3	1.0	20	0	102	31-172	21.02	3.48	30	
Chloroform	19.68	1.0	20	0	98.4	66-135	20.89	5.96	30	
Chloromethane	20.45	1.0	20	0.49	99.8	46-148	20.9	2.18	30	
cis-1,2-Dichloroethene	31	1.0	20	11.24	98.8	75-134	31.47	1.5	30	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: BB&E, Inc.
Work Order: 19090657
Project: SSW Collis 2019 LTM Task 3

QC BATCH REPORT

Batch ID: **R271003** Instrument ID **VMS11** Method: **SW8260C**

cis-1,3-Dichloropropene	18.18	1.0	20	0	90.9	70-130	17.2	5.54	30	
Dibromochloromethane	16.03	1.0	20	0	80.2	60-115	15.28	4.79	30	
Dibromomethane	20.8	1.0	20	0	104	79-126	20.61	0.918	30	
Dichlorodifluoromethane	23.07	1.0	20	0	115	20-120	24.12	4.45	30	
Ethylbenzene	18.53	1.0	20	0	92.6	76-123	18.65	0.646	30	
Hexachlorobutadiene	15.8	1.0	20	0	79	70-155	15.45	2.24	30	
Hexachloroethane	13.2	1.0	20	0	66	50-124	13.59	2.91	30	
Iodomethane	13.19	5.0	20	0	66	60-160	8.39	44.5	30	R
Isopropylbenzene	18.23	1.0	20	0	91.2	80-127	18.63	2.17	30	
m,p-Xylene	37.08	2.0	40	0	92.7	75-130	37.04	0.108	30	
Methyl tert-butyl ether	18.76	1.0	20	0	93.8	68-129	19.37	3.2	30	
Methylene chloride	21.46	5.0	20	0	107	72-125	21.99	2.44	30	
Naphthalene	17.91	5.0	20	0	89.6	55-160	16.52	8.07	30	
n-Butylbenzene	18.4	1.0	20	0	92	75-145	18.06	1.87	30	
n-Propylbenzene	17.93	1.0	20	0	89.6	76-116	17.79	0.784	30	
o-Xylene	18.44	1.0	20	0	92.2	76-127	18.94	2.68	30	
p-Isopropyltoluene	18.56	1.0	20	0	92.8	61-164	18.59	0.162	30	
sec-Butylbenzene	18.16	1.0	20	0	90.8	80-134	17.94	1.22	30	
Styrene	19.81	1.0	20	0	99	83-137	19.71	0.506	30	
tert-Butyl alcohol	97.75	20	100	13.75	84	70-130	86.23	12.5	30	
tert-Butylbenzene	17.49	1.0	20	0	87.4	70-130	17.68	1.08	30	
Tetrachloroethene	18.32	1.0	20	0	91.6	68-166	18.22	0.547	30	
Tetrahydrofuran	16.1	1.0	20	0	80.5	54-139	15.54	3.54	30	
Toluene	18.33	1.0	20	0	91.6	76-125	18.51	0.977	30	
trans-1,2-Dichloroethene	21.73	1.0	20	0.56	106	80-140	22.74	4.54	30	
trans-1,3-Dichloropropene	15.11	1.0	20	0	75.6	56-132	14.72	2.61	30	
trans-1,4-Dichloro-2-butene	9.78	2.0	20	0	48.9	46-118	9.49	3.01	30	
Trichloroethene	19.72	1.0	20	0	98.6	77-125	19.5	1.12	30	
Trichlorofluoromethane	17.92	1.0	20	0	89.6	60-140	18.23	1.72	30	
Vinyl chloride	21.73	1.0	20	0	109	50-136	22.14	1.87	30	
Surr: 1,2-Dichloroethane-d4	*20.24*	0	*20*	0	*101*	*75-120*	20.73	*2.39*	*30*	
Surr: 4-Bromofluorobenzene	*19.68*	0	*20*	0	*98.4*	*80-110*	20.05	*1.86*	*30*	
Surr: Dibromofluoromethane	*21.12*	0	*20*	0	*106*	*85-115*	20.68	*2.11*	*30*	
Surr: Toluene-d8	*19.73*	0	*20*	0	*98.6*	*85-110*	19.96	*1.16*	*30*	

The following samples were analyzed in this batch:

19090657-01A	19090657-02A	19090657-03A
19090657-04A	19090657-05A	19090657-06A
19090657-07A	19090657-08A	19090657-09A
19090657-10A	19090657-11A	19090657-16A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: BB&E, Inc.
Work Order: 19090657
Project: SSW Collis 2019 LTM Task 3

QC BATCH REPORT

Batch ID: **R271072a** Instrument ID **VMS9** Method: **SW8260B**

MBLK Sample ID: **VBLKW1-190920-R271072a** Units: **µg/L** Analysis Date: **9/20/2019 11:09 AM**
Client ID: Run ID: **VMS9_190920A** SeqNo: **5934258** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	U	1.0								
Surr: Toluene-d8	*10.95*	0	*10*	0	*110*	*74-124*	0			

LCS Sample ID: **VLCSW1-190920-R271072a** Units: **µg/L** Analysis Date: **9/20/2019 10:23 AM**
Client ID: Run ID: **VMS9_190920A** SeqNo: **5934257** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	38.65	1.0	40	0	96.6	70-130	0			
Surr: Toluene-d8	*10.16*	0	*10*	0	*102*	*74-124*	0			

MS Sample ID: **19090657-04A MS** Units: **µg/L** Analysis Date: **9/20/2019 12:12 PM**
Client ID: **COL-GW-04** Run ID: **VMS9_190920A** SeqNo: **5934260** Prep Date: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	379.3	10	400	0	94.8	70-130	0			
Surr: Toluene-d8	*97.5*	0	*100*	0	*97.5*	*74-124*	0			

MSD Sample ID: **19090657-04A MSD** Units: **µg/L** Analysis Date: **9/20/2019 12:27 PM**
Client ID: **COL-GW-04** Run ID: **VMS9_190920A** SeqNo: **5934261** Prep Date: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	389.5	10	400	0	97.4	70-130	379.3	2.65	30	
Surr: Toluene-d8	*108*	0	*100*	0	*108*	*74-124*	97.5	*10.2*	*30*	

The following samples were analyzed in this batch: 19090657-04A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: BB&E, Inc.
Work Order: 19090657
Project: SSW Collis 2019 LTM Task 3

QC BATCH REPORT

Batch ID: **R270237** Instrument ID **WETCHEM** Method: **SW9034**

MBLK Sample ID: **MB-R270237-R270237** Units: **mg/L** Analysis Date: **9/11/2019 11:00 AM**
Client ID: Run ID: **WETCHEM_190911G** SeqNo: **5909444** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfide	U	1.0								

LCS Sample ID: **LCS-R270237-R270237** Units: **mg/L** Analysis Date: **9/11/2019 11:00 AM**
Client ID: Run ID: **WETCHEM_190911G** SeqNo: **5909445** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfide	8.52	1.0	10.75	0	79.3	56-102	0			

MS Sample ID: **19090657-05CMS** Units: **mg/L** Analysis Date: **9/11/2019 11:00 AM**
Client ID: **COL-GW-05** Run ID: **WETCHEM_190911G** SeqNo: **5909664** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfide	11.1	1.0	13.44	0	82.6	56-102	0			

MSD Sample ID: **19090657-05CMSD** Units: **mg/L** Analysis Date: **9/11/2019 11:00 AM**
Client ID: **COL-GW-05** Run ID: **WETCHEM_190911G** SeqNo: **5909665** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfide	10.65	1.0	13.44	0	79.3	56-102	11.1	4.14	10	

The following samples were analyzed in this batch: 19090657-05C

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: BB&E, Inc.
Work Order: 19090657
Project: SSW Collis 2019 LTM Task 3

QC BATCH REPORT

Batch ID: **R270362** Instrument ID **WETCHEM** Method: **SW9034**

MBLK Sample ID: **MB-R270362-R270362** Units: **mg/L** Analysis Date: **9/12/2019 02:00 PM**
Client ID: Run ID: **WETCHEM_190912K** SeqNo: **5913325** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfide	U	1.0								

LCS Sample ID: **LCS-R270362-R270362** Units: **mg/L** Analysis Date: **9/12/2019 02:00 PM**
Client ID: Run ID: **WETCHEM_190912K** SeqNo: **5913326** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfide	8.28	1.0	10.75	0	77	56-102	0			

The following samples were analyzed in this batch: 19090657-06C 19090657-12C 19090657-13C

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: BB&E, Inc.
Work Order: 19090657
Project: SSW Collis 2019 LTM Task 3

QC BATCH REPORT

Batch ID: **R270402** Instrument ID **IC4** Method: **SW9056A**

MBLK Sample ID: **MBLK-R270402** Units: **mg/L** Analysis Date: **9/12/2019 10:41 AM**
Client ID: Run ID: **IC4_190912A** SeqNo: **5914751** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	U	1.0								
Sulfate	U	1.0								

LCS Sample ID: **LCS-R270402** Units: **mg/L** Analysis Date: **9/12/2019 11:00 AM**
Client ID: Run ID: **IC4_190912A** SeqNo: **5914753** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	9.345	1.0	10	0	93.5	88-110	0			
Sulfate	9.482	1.0	10	0	94.8	90-110	0			

MS Sample ID: **19090657-05B MS** Units: **mg/L** Analysis Date: **9/12/2019 04:26 PM**
Client ID: **COL-GW-05** Run ID: **IC4_190912A** SeqNo: **5914777** Prep Date: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	117.8	10	100	18.33	99.5	88-110	0			
Sulfate	130.3	10	100	34.61	95.7	90-110	0			

MS Sample ID: **19090513-36E MS** Units: **mg/L** Analysis Date: **9/13/2019 12:06 AM**
Client ID: Run ID: **IC4_190912A** SeqNo: **5914801** Prep Date: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	137	10	100	38.55	98.4	90-110	0			

MSD Sample ID: **19090657-05B MSD** Units: **mg/L** Analysis Date: **9/12/2019 04:45 PM**
Client ID: **COL-GW-05** Run ID: **IC4_190912A** SeqNo: **5914778** Prep Date: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	119.2	10	100	18.33	101	88-110	117.8	1.13	20	
Sulfate	131.8	10	100	34.61	97.2	90-110	130.3	1.14	20	

MSD Sample ID: **19090513-36E MSD** Units: **mg/L** Analysis Date: **9/13/2019 12:25 AM**
Client ID: Run ID: **IC4_190912A** SeqNo: **5914802** Prep Date: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	137.9	10	100	38.55	99.3	90-110	137	0.64	20	

The following samples were analyzed in this batch: 19090657-05B, 19090657-06B, 19090657-12B, 19090657-13B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: BB&E, Inc.
Work Order: 19090657
Project: SSW Collis 2019 LTM Task 3

QC BATCH REPORT

Batch ID: **R270695B** Instrument ID **LACHAT** Method: **E353.2 R2.0**

MBLK Sample ID: **MBLK2-R270695B** Units: **mg/L** Analysis Date: **9/17/2019 10:40 AM**
Client ID: Run ID: **LACHAT_190917A** SeqNo: **5922942** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate-Nitrite	U	0.020								

LCS Sample ID: **LCS2-R270695B** Units: **mg/L** Analysis Date: **9/17/2019 10:41 AM**
Client ID: Run ID: **LACHAT_190917A** SeqNo: **5922943** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate-Nitrite	2.49	0.020	2.5	0	99.6	80-120	0			

MS Sample ID: **19090657-05D MS** Units: **mg/L** Analysis Date: **9/17/2019 11:02 AM**
Client ID: **COL-GW-05** Run ID: **LACHAT_190917A** SeqNo: **5922961** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate-Nitrite	2.413	0.020	2.5	0.007134	96.2	75-125	0			

MS Sample ID: **19090893-01A MS** Units: **mg/L** Analysis Date: **9/17/2019 11:19 AM**
Client ID: Run ID: **LACHAT_190917A** SeqNo: **5922975** Prep Date: DF: **2**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate-Nitrite	10.31	0.040	2.5	7.342	119	75-125	0			E

MSD Sample ID: **19090657-05D MSD** Units: **mg/L** Analysis Date: **9/17/2019 11:04 AM**
Client ID: **COL-GW-05** Run ID: **LACHAT_190917A** SeqNo: **5922962** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate-Nitrite	2.561	0.020	2.5	0.007134	102	75-125	2.413	5.95	20	

MSD Sample ID: **19090893-01A MSD** Units: **mg/L** Analysis Date: **9/17/2019 11:20 AM**
Client ID: Run ID: **LACHAT_190917A** SeqNo: **5922976** Prep Date: DF: **2**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate-Nitrite	10.25	0.040	2.5	7.342	116	75-125	10.31	0.603	20	E

The following samples were analyzed in this batch:

19090657-05D	19090657-06D	19090657-12D
19090657-13D		

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Cincinnati, OH +1 513 733 5336
Everett, WA +1 425 356 2600
Fort Collins, CO +1 970 490 1511
Holland, MI +1 616 399 6070
Houston, TX +1 281 530 5656
Middletown, PA +1 717 944 5541
Spring City, PA +1 610 948 4903
Salt Lake City, UT +1 801 266 7700
South Charleston, WV +1 304 356 3168
York, PA +1 717 505 5280

Chain of Custody Form

Page 1 of 2

COC ID: 192010

ALS Project Manager:

ALS Work Order #: 1909c657

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order		Project Name	SSW Collis 2019 LTM Task 3	A	VOCs
Work Order		Project Number		B	Chloride, Nitrite, Sulfate
Company Name	BB&E, LLC	Bill To Company	BB&E, LLC	C	Dissolved Iron and Manganese
Send Report To	Kacie Van Buskirk	Invoice Attn	Accounts Payable	D	Sulfide
Address	235 East Main Street Suite 107	Address	235 East Main Street Suite 107	E	Methane, Ethane, Ethene
				F	1,4-Dioxane
City/State/Zip	Northville, MI 48167	City/State/Zip	Northville, MI 48167	G	Nitrate
Phone	(248) 489-9636	Phone	(248) 489-9636	H	
Fax	(248) 489-9646	Fax	(248) 489-9646	I	
e-Mail Address		e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	COL-GW-01	9/9/19	0950	GW	1,8	3	X										
2	COL-GW-02	9/9/19	1020	GW	1,8	3	X										
3	COL-GW-03	9/9/19	1050	GW	1,8	3	X										
4	COL-GW-04	9/9/19	1150	GW	1,8	3	X					X					
5	COL-GW-05	9/9/19	1230	GW	1,3,7,8	12	X	X	X	X	X	V					
-5	COL-GW-05 MS/MSD	9/9/19	1230	GW	1,3,7,8	24	X	X	X	X	X	X					
-6	COL-GW-04	9/9/19	1230	GW	1,3,7,8	12	X	X	X	X	X	X					
-7	COL-GW-07	9/9/19	1350	GW	1,8	3	X										
-8	COL-GW-08	9/9/19	1430	GW	1,8	3	X										
-9	COL-GW-09	9/9/19	1455	GW	1,8	3	X										

Sampler(s) Please Print & Sign: Kacie Van Buskirk

Shipment Method: FedEx

Required Turnaround Time: (Check Box) ☒ Std 10 WK Days ☐ 5 WK Days ☐ Other ☐ 2 WK Days ☐ 24 Hour

Results Due Date:

Relinquished by:	Date: 9/10/19	Time: 1500	Received by: FED EX
Relinquished by: FED EX	Date: 9/11/19	Time: 0930	Received by (Laboratory):
Logged by (Laboratory): DES	Date: 9/11/19	Time: 1100	Checked by (Laboratory):

Notes:

Cooler ID	Cooler Temp.
SR2	3.2°C
pH12	

QC Package: (Check One Box Below)
☐ Level II Std QC ☐ TRRP Checklist
☐ Level III Std QC/Raw Data ☐ TRRP Level IV
☐ Level IV SW846/CLP
☐ Other

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

Cincinnati, OH +1 513 733 5336
Fort Collins, CO +1 970 490 1511
Everett, WA +1 425 356 2600
Holland, MI +1 616 399 6070
Houston, TX +1 281 530 5656
Spring City, PA +1 610 948 4903
South Charleston, WV +1 304 356 3168
Middletown, PA +1 717 944 5541
Salt Lake City, UT +1 801 266 7700
York, PA +1 717 505 5280

Chain of Custody Form

Page 2 of 2

COC ID: 192012

ALS Project Manager:

ALS Work Order #: 1909J657

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order		Project Name	SSW Collis 2019 LTM Task 3	A	VOCs
Work Order		Project Number		B	Chloride, Nitrite, Sulfate
Company Name	BB&E, LLC	Bill To Company	BB&E, LLC	C	Dissolved Iron and Manganese
Send Report To	Kacie Van Buskirk	Invoice Attn	Accounts Payable	D	Sulfide
Address	235 East Main Street Suite 107	Address	235 East Main Street Suite 107	E	Methane, Ethane, Ethene
				F	1,4-Dioxane
City/State/Zip	Northville, MI 48167	City/State/Zip	Northville, MI 48167	G	Nitrate
Phone	(248) 489-9636	Phone	(248) 489-9636	H	
Fax	(248) 489-9646	Fax	(248) 489-9646	I	
e-Mail Address		e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
10	COL-GW-10	9/9/19	1600	GW	1,8	3	X										
11	COL-GW-11	9/9/19	1630	GW	1,8	3	X										
12	COL-GW-12	9/10/19	0815	GW	1,3,7,8	12	X	X	X	X	X	X	X				
13	COL-GW-13	9/10/19	0900	GW	1,3,7,8	12 VW	X	X	X	X	X	X	X				
14	COL-GW-14	9/10/19	0945	GW	1,8	~~2~~ 3	X	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	X	KP			
15	COL-GW-15	9/10/19	0945	GW	1,8	3	X										
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign: Kacie Van Buskirk

Shipment Method: Fedex

Required Turnaround Time: (Check Box) ☒ Std 10 WK Days ☐ 5 WK Days ☐ 2 WK Days ☐ 24 Hour ☐ Other

Results Due Date:

Relinquished by: Date: 9/10/19 Time: 1300 Received by: FED EX

Relinquished by: FED EX Date: 9/11/19 Time: 0930 Received by (Laboratory):

Logged by (Laboratory): DFS Date: 9/11/19 Time: 1100 Checked by (Laboratory):

Notes:

Cooler ID	Cooler Temp.
SR2	3.2°C
pH2	

QC Package: (Check One Box Below)
☐ Level II Std QC ☐ TRRP Checklist
☐ Level III Std QC/Raw Data ☐ TRRP Level IV
☐ Level IV SW846/CLP
☐ Other

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other ~~8-4°C~~ 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

ALS Group, USA

Sample Receipt Checklist

Client Name: **BBE** Date/Time Received: **11-Sep-19 09:30**

Work Order: **19090657** Received by: **DS**

Checklist completed by Diane Shaw (eSignature) 11-Sep-19 (Date) Reviewed by: Chad Whelton (eSignature) 12-Sep-19 (Date)

Matrices: Groundwater
Carrier name: FedEx

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Sample(s) received on ice?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	3.2/3.2 c		SR2
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	9/11/2019 11:32:01 AM		
Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:	-		

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:

ATTACHMENT B

FIELD NOTES

BB&E CONSULTING ENGINEERS & PROFESSIONALS
235 E. Main St, Suite 107 Northville, MI 48167
p 248.489.9636 f 248.489.9646

0700 KVB onsite; pick up and sort through equipment. Compressor for the bladder pump is missing.
0730 Commence water levels
0830 Check equipment
0900 Trouble shoot peristaltic pump All wells will be purged/developed with the peristaltic pump due to the missing part for the bladder pump.
0935 Commence purge @ MW-47S
0950 Sample MW-47S for VOCs (COL-GW-01)
1005 Commence purge @ PZ-47
1020 Sample PZ-47 for VOCs (COL-GW-02)
1045 Commence purge @ PZ-48
1050 PZ-48 was drying up very fast. The well was allowed to recharge and then sampled.
1050 Sample PZ-48 for VOCs (COL-GW-03)
1130 Commence purge @ MW-45
1150 Sample MW-45 for VOCs and 1,4-dioxane (COL-GW-04)
1205 Commence purge @ MW-53
1230 Sample MW-53 for VOCs, MNA, 1,4-dioxane (COL-GW-05)
1230 Sample MW-53 MS/MSD for VOCs, MNA, 1,4-dioxane (COL-GW-05MS/MSD)
1230 Sample MW-53 Dup for VOCs, MNA, 1,4-dioxane (COL-GW-06)
1330 Commence purge @ MW-56
1350 Sample MW-56 for VOCs, (COL-GW-07)
1355 Dump ~15 gal purge water @ Collis WWTP
1405 Commence purge @ MW-38
1430 Sample MW-38 for VOCs (COL-GW-08)
1435 Commence purge @ MW-43
1455 Sample MW-43 for VOCs (COL-GW-09)
1520 Commence purge @ MW-50
1600 Sample MW-50 for VOCs (COL-GW-10)
1610 Commence Purge @ MW-50S
1630 Sample MW-50S for VOCs (COL-GW-11)
1645 Cal Check equipment
1700 Dump ~15 gal Purge water
1710 KVB off site

FIELD NOTES

Project SSW Collis LTM second semi-annual 2019

Date 9/9/19

Field Rep. KVB

BB&E
CONSULTING ENGINEERS & PROFESSIONALS
235 E. Main St, Suite 107 Northville, MI 48167
p 248.489.9636 f 248.489.9646

0700 KVB onsite
0710 cal check equipment
0745 Commence purge @ MW-42
0815 Sample MW-42 for VOCs, MNA, 1,4-dioxane (COL-GW-12)
0835 Commence purge @ MW-34
0900 Sample MW-34 for VOCs, MNA, 1,4-dioxane (COL-GW-13)
0920 Commence purge @ MW-39
0945 Sample MW-39 for VOCs (COL-GW-14)
0945 Sample MW-39 Dup for VOCs (COL-GW-15)
1000 Cal check equipment
1030 Pack up
1100 Dump ~ 10 gal purge water @ Collis WWTP
1230 Ship Samples and Equipment

Note: Equipment blank was not collected since the bladder pump was not utilized.

FIELD NOTES

Project SSW Collis LTM second semi-annual 2019

Date 9/10/19

Field Rep. KVB

MONITOR WELL STATIC WATER LEVEL FORM

Project Name: LTM SA 2 2019 **DATE:** 9/9 /19
Water Level Indicator ID # Solinst **Field Book #** NA
LOCATION: SSW Collis, Clinton Iowa **Page #** 1 of 1

Monitor Well Number	Total Well Depth	Well Screen Length	Time	Depth to Static Water Level
MW-38	9.95	5 ft	0732	4.44
MW-39	13.91	5 ft	0730	4.10
MW-50S	12.28	5 ft	0755	3.61
PZ-47	10.89	10 ft	0747	3.25
PZ-48	10.65	10 ft	0750	5.20
MW-34	31.6	5 ft	0740	5.34
MW-45	25.59	5 ft	0802	0.0
MW-47S	17.93	5 ft	0745	3.01
MW-50	24.77	5 ft	0757	3.54
MW-56	30	5 ft	0810	2.35
MW-42	50.2	5 ft	0737	4.80
MW-53	52.24	5 ft	0805	0.0
MW-43	99.38	5 ft	0734	Lift

Note: total well depth to be measured at time of gauging.
Comments: _____
Sampler___ KVB_____ Observer _____

Equipment Calibration Daily Log

BB&E

Date:	9/9/19	Project Name:	LTM SA2 2019
Project#:	02028025 Task 3	Recorded by:	KVB

WATER QUALITY METER	Model: YSI PRO				Morning Calibration/ Check	Evening Check (one point only)	Additional Calib/Check (if needed)
	Equipment ID#:						
	Parameter	Standard	Exp Date	Lot#	Time: 0830	Time: 1645	Time:
First Point Calibration (Auto)	pH	7.0	12-31-19	BGL 701	Initials: 7.0	Value: 7.02	
	Turbidity (NTU)	100	12-2019	3804	100	Value: 100.2	
	Conductivity (mS/cm)	1.413	10-10-19	13410	1.413	Value: 1.414	
	ORP mV	240	12-31-23	3080	240	Value: 241	
	DO (mg/L)	8.9-9. (ambient air)	NA	NA	8.91	Value: 8.91	
Second Point Calibration	pH	4.0	12-31-20	BGL 214	Initials: 4.0	Value: 4.02	
	Turbidity (NTU)	750	12-2019	3793	750	Value: 752	
	~~Conductivity (mS/cm)~~					Value:	
Third Point Calibration	pH	10.0	12-31-20	BGL 108	Initials: 10.0	Value: 10.04	
	Turbidity	15.0	11-2019	3781	15.0	Value: 15.1	
	Turbidity	Low	06-2020	3804	0.10	0.11	

Turbidity Meter Model and Equipment ID: Hanna HI

Additional Remarks: _____

Equipment Calibration Daily Log

BB&E

Date:	9/10/19	Project Name:	LTM SA2 2019
Project#:	02028025 Task 3	Recorded by:	KVB

WATER QUALITY METER	Model: YSI PVO Equipment ID#:				Morning Calibration/ Check	Evening Check (one point only)	Additional Calib/Check (if needed)
	Parameter	Standard	Exp Date	Lot#	Time: 0710	Time: 1000	Time:
First Point Calibration (Auto)	pH	7.0	12-31-19	BGL 701	Initials: TO	Value: 7.02	
	Turbidity (NTU)	100	12-2019	3804	100	Value: 101	
	Conductivity (mS/cm)	1.413	10-6-19	13410	1.413	Value: 1.412	
	ORP	240	12-31-23	3086	240	Value: 241	
	DO (mg/L)	8.9-9. (ambient air)	NA	NA	8.92	Value: 8.92	
Second Point Calibration	pH	4.0	12-31-20	BGL 214	Initials:	Value:	
	Turbidity (NTU)	750	12-2019	3793	750	Value: 751	
	~~Conductivity (mS/cm)~~					~~Value:~~	
Third Point Calibration	pH	10.0	12-31-20	BGL 108	Initials: 10.01	Value: 10.03	
	Turbidity	15.0	11-2019	3781	15.0	Value: 15.01	
	Turbidity	20.10	06-2020	3806	0.10	0.11	

Turbidity Meter Model and Equipment ID: Hanna HI

Additional Remarks: _____

Monitoring Well Sample Collection Form

BB&E

LOCATION	Site: SSW Collis	Well ID: MW-475	Date: 9/9/19
	Project: #: LTM SA2 2019 SSW Collis	Sample ID: COL-GW-~~DS~~ G1	Recorded by: KVB
	Weather Conditions & Barometric Pressure: 60°F, Rain, 30.05 Enlmg		

EQUIPMENT	Purging Equipment: Peristaltic	Water Level Indicator: Solinst	PID Type/ID#: NA
	Water Quality Meter Type and #: YSI	Sampling Equipment: peristaltic	Turbidimeter and #: Hanna H1

WELL INFO	Casing ID (in): 2	Well Volume: ~2.38gal	Condition of Well: Good
	Initial Depth to Water (ft): 3.01	Total Volume Purged: ~2.5gal	Water in Well Vault? NO
	Total Well Depth (ft): 17.93	Depth of Pump Intake (ft): 4ft from bottom	Well Mouth PID (ppm): NA
	Water Column Thickness (ft): 14.92	Immiscible Layer: Yes (No)	Ambient PID (ppm): NA
	Remarks:		

CASING INFO											
Casing ID (in) [a]:	1.0	1.5	(2.0)	2.2	3.0	4.0	4.3	5.0	6.0	7.0
Unit Casing Volume (gal/lin ft) [b]:	0.04	0.09	(0.16)	0.20	0.37	0.65	0.75	1.0	1.5	2.0

Date	Time (24 hr)	Water Level (FTOC)	Volume Removed (L)	Pumping Rate (Lpm)	Temp (C)	pH	Cond (mS/cm)	DO (mg/L)	Turb (NTU)	ORP (mv)	Remarks (odor, clarity, etc)
9/9/19	0935	3.07	na	200	13.40	7.32	0.554	1.02	12.7	-92.0	Clear
↓	0940	3.04	na	200	13.56	7.15	0.514	0.55	6.8	-94.7	
	0945	3.08	na	200	14.19	7.08	0.507	0.42	5.9	-95.5	
↓	0950	3.08	na	200	14.21	7.04	0.502	0.40	5.7	-96.2	

Pump Rate: <=0.5 L/min Drawdown: <0.33 ft Measurements: 5 mins Stabilization for 3 consecutive readings
Stabilization: +/-0.5C, +/-0.1 pH, +/-3% Cond, +/- 0.3 mg/L DO, +/-10% Tub (or < 50 NTU), +/- 10 mV ORP

Sample Date/Time: 0950 9/9/19	# of Containers	Container Volume	Container Material	Preservative	Filter (Y/N)	Pump, Bailer, Foot Valve	Duplicate (# of Containers)	MS/MSD (# of Containers)	Parameter(s) and Analytical Method
Laboratory and Chain-of-Custody #: ALS 192610	(3)	40mL	VOA	HCl	N	Pump			VOCs
	~~3~~	40mL	VOA	HCl	N	Pump			1,4-Dioxane
	~~2~~	40mL	VOA	HCl	N	Pump			Methane, Ethane, Ethene (MNAs)
	~~1~~	250mL	Plastic	H2SO4	N	Pump			Nitrite/Nitrate (MNAs)
	~~1~~	500mL	Plastic		N	Pump			Chloride, Sulfate, Metals (MNAs)
	~~1~~	500mL	Plastic	ZnAc	N	Pump			Sulfide (MNAs)

Monitoring Well Sample Collection Form

BB&E

LOCATION	Site: SSW Collis	Welll ID: ~~MW~~ PZ-48	Date: 9/ 9/19
	Project: #: LTM SA2 2019 SSW Collis	Sample ID: COL-GW- 02	Recorded by: KVB
	Weather Conditions & Barometric Pressure: 60°F; Rain; 30.05 InHg		

EQUIPMENT	Purging Equipment: Peristaltic	Water Level Indicator: Solinst	PID Type/ID#: NA
	Water Quality Meter Type and #: YSI	Sampling Equipment: peristaltic	Turbidimeter and #: Hanna HI

WELL INFO	Casing ID (in): 1in	Well Volume: 0.305 gal	Condition of Well: Good
	Initial Depth to Water (ft): 3.25	Total Volume Purged: ~1.5 gal	Water in Well Vault? NO
	Total Well Depth (ft): 10.89	Depth of Pump Intake (ft): Lift from bottom	Well Mouth PID (ppm): NA
	Water Column Thickness (ft): 7.64	Immiscible Layer: Yes (No)	Ambient PID (ppm): NA
	Remarks:		

CASING INFO											
Casing ID (in) [a]:	(1.0)	1.5	2.0	2.2	3.0	4.0	4.3	5.0	6.0	7.0
Unit Casing Volume (gal/lin ft) [b]:	0.04	0.09	0.16	0.20	0.37	0.65	0.75	1.0	1.5	2.0

Date	Time (24 hr)	Water Level (FTOC)	Volume Removed (L)	Pumping Rate (Lpm)	Temp (C)	pH	Cond (mS/cm)	DO (mg/L)	Turb (NTU)	ORP (mv)	Remarks (odor, clarity, etc)
9/9/19	1005	3.30	na	150	15.23	6.96	0.772	25.5	72.4	~~-7.8~~ -72.6	Clear
	1010	3.42	na	150	16.18	6.83	0.809	0.56	17.9	-72.9	
	1015	3.44	na	150	16.12	6.90	0.806	0.44	12.2	-70.6	
↓	1020	3.46	na	150	16.16	6.88	0.807	0.42	11.7	-69.9	

Pump Rate: <=0.5 L/min Drawdown: <0.33 ft Measurements: 5 mins Stabilization for 3 consecutive readings
Stabilization: +/-0.5C, +/-0.1 pH, +/-3% Cond, +/- 0.3 mg/L DO, +/-10% Tub (or < 50 NTU), +/- 10 mV ORP

Sample Date/Time: 1020 9/9/19	# of Containers	Container Volume	Container Material	Preservative	Filter (Y/N)	Pump, Bailer, Foot Valve	Duplicate (# of Containers)	MS/MSD (# of Containers)	Parameter(s) and Analytical Method
Laboratory and Chain-of-Custody #: 192016	(3)	40mL	VOA	HCl	N	Pump			VOCs
	~~3~~	40mL	VOA	HCl	N	Pump			1,4-Dioxane
	~~2~~	40mL	VOA	HCl	N	Pump			Methane, Ethane, Ethene (MNAs)
ALS	~~1~~	250mL	Plastic	H2SO4	N	Pump			Nitrite/Nitrate (MNAs)
	~~1~~	500mL	Plastic		N	Pump			Chloride, Sulfate, Metals (MNAs)
	~~1~~	500mL	Plastic	ZnAc	N	Pump			Sulfide (MNAs)

Monitoring Well Sample Collection Form

BB&E

LOCATION	Site: SSW Collis	Welll ID: PZ-48	Date: 9/9/19
	Project: #: LTM SA2 2019 SSW Collis	Sample ID: COL-GW-023	Recorded by: KVB
	Weather Conditions & Barometric Pressure: 65°F, Rain, 30.05 inHg		

EQUIPMENT	Purging Equipment: Peristaltic	Water Level Indicator: Solinst	PID Type/ID#: NA
	Water Quality Meter Type and #: YSI	Sampling Equipment: Peristaltic	Turbidimeter and #: Hanna M1

WELL INFO	Casing ID (in): 1.0	Well Volume: ~0.218	Condition of Well: Good
	Initial Depth to Water (ft): 5.20	Total Volume Purged: ~0.5gal	Water in Well Vault? NO
	Total Well Depth (ft): 10.65	Depth of Pump Intake (ft): 6ft from bottom	Well Mouth PID (ppm): NA
	Water Column Thickness (ft): 5.45	Immiscible Layer: Yes (No)	Ambient PID (ppm): NA
	Remarks:		

CASING INFO											
	Casing ID (in) [a]:	(1.0)	1.5	2.0	2.2	3.0	4.0	4.3	5.0	6.0	7.0
	Unit Casing Volume (gal/lin ft) [b]:	0.04	0.09	0.16	0.20	0.37	0.65	0.75	1.0	1.5	2.0

Date	Time (24 hr)	Water Level (FTOC)	Volume Removed (L)	Pumping Rate (Lpm)	Temp (C)	pH	Cond (mS/cm)	DO (mg/L)	Turb (NTU)	ORP (mv)	Remarks (odor, clarity, etc)
9/9/19	1045	5.26	na	150	16.80	7.25	0.578	1.16	36.2	-38.4	WPI low
↓	1055	10.00	na	150	16.77	7.20	0.546	0.98	37.7	-40.2	drying up very fast

Pump Rate: <=0.5 L/min Drawdown: <0.33 ft Measurements: 5 mins Stabilization for 3 consecutive readings
Stabilization: +/-0.5C, +/-0.1 pH, +/-3% Cond, +/- 0.3 mg/L DO, +/-10% Tub (or < 50 NTU), +/- 10 mV ORP

Sample Date/Time: 1050 9/9/19	# of Containers	Container Volume	Container Material	Preservative	Filter (Y/N)	Pump, Bailer, Foot Valve	Duplicate (# of Containers)	MS/MSD (# of Containers)	Parameter(s) and Analytical Method
Laboratory and Chain-of-Custody #: 192010	3	40mL	VOA	HCl	N	Pump			VOCs
	~~3~~	40mL	VOA	HCl	N	Pump			1,4-Dioxane
	~~2~~	40mL	VOA	HCl	N	Pump			Methane, Ethane, Ethene (MNAs)
ALS	~~1~~	250mL	Plastic	H2SO4	N	Pump			Nitrite/Nitrate (MNAs)
	~~1~~	500mL	Plastic		N	Pump			Chloride, Sulfate, Metals (MNAs)
	~~1~~	500mL	Plastic	ZnAc	N	Pump			Sulfide (MNAs)

Monitoring Well Sample Collection Form

BB&E

LOCATION	Site: SSW Collis	Welll ID: MW-45	Date: 9/9/19
	Project: #: LTM SA2 2019 SSW Collis	Sample ID: COL-GW-04	Recorded by: KVB
	Weather Conditions & Barometric Pressure: 70°F, overcast, 30.25 in/Hg		

EQUIPMENT	Purging Equipment: Peristaltic	Water Level Indicator: Solinst	PID Type/ID#: NA
	Water Quality Meter Type and #: YSI	Sampling Equipment: Peristaltic	Turbidimeter and #: Hanna HI

WELL INFO	Casing ID (in): 2 in	Well Volume: ~4.09 gal	Condition of Well: Good
	Initial Depth to Water (ft): 0.0	Total Volume Purged: ~3 gal	Water in Well Vault? No
	Total Well Depth (ft): 25.59	Depth of Pump Intake (ft): 24ft from bottom	Well Mouth PID (ppm): NA
	Water Column Thickness (ft): 25.59	Immiscible Layer: Yes (No)	Ambient PID (ppm): NA
	Remarks:		

CASING INFO											
Casing ID (in) [a]:	1.0	1.5	(2.0)	2.2	3.0	4.0	4.3	5.0	6.0	7.0
Unit Casing Volume (gal/lin ft) [b]:	0.04	0.09	0.16	0.20	0.37	0.65	0.75	1.0	1.5	2.0

Date	Time (24 hr)	Water Level (FTOC)	Volume Removed (L)	Pumping Rate (Lpm)	Temp (C)	pH	Cond (mS/cm)	DO (mg/L)	Turb (NTU)	ORP (mv)	Remarks (odor, clarity, etc)
9/9/19	1130	0.0	na	200	13.07	7.39	0.605	0.97	10.7	12.9	Clear
	1135	0.0	na	200	12.79	7.20	0.604	0.44	6.2	26.0	
	1140	0.0	na	200	12.80	7.17	0.601	0.30	5.7	29.1	
	1145	0.0	na	200	12.77	7.18	0.604	0.30	5.2	29.3	
	1150	0.0	na	200	12.78	7.18	0.600	0.31	5.1	29.7	

Pump Rate: <=0.5 L/min Drawdown: <0.33 ft Measurements: 5 mins Stabilization for 3 consecutive readings
Stabilization: +/-0.5C, +/-0.1 pH, +/-3% Cond, +/- 0.3 mg/L DO, +/-10% Tub (or < 50 NTU), +/- 10 mV ORP

Sample Date/Time: 1150 9/9/19	# of Containers	Container Volume	Container Material	Preservative	Filter (Y/N)	Pump, Bailer, Foot Valve	Duplicate (# of Containers)	MS/MSD (# of Containers)	Parameter(s) and Analytical Method
Laboratory and Chain-of-Custody #: 192010	3	40mL	VOA	HCl	N	Pump			VOCs
	3	40mL	VOA	HCl	N	Pump			1,4-Dioxane
	~~2~~	40mL	VOA	HCl	N	Pump			Methane, Ethane, Ethene (MNAs)
ALS	~~1~~	250mL	Plastic	H2SO4	N	Pump			Nitrite/Nitrate (MNAs)
	~~1~~	500mL	Plastic		N	Pump			Chloride, Sulfate, Metals (MNAs)
	~~1~~	500mL	Plastic	ZnAc	N	Pump			Sulfide (MNAs)

Monitoring Well Sample Collection Form

BB&E

LOCATION	Site: SSW Collis	Welll ID: MW-53	Date: 9/ 9 /19
	Project: #: LTM SA2 2019 SSW Collis	Sample ID: COL-GW-05	Recorded by: KVB
	Weather Conditions & Barometric Pressure: 70°F; Overcast; 30.05 inHg		

EQUIPMENT	Purging Equipment: peristaltic	Water Level Indicator: Solinst	PID Type/ID#: NA
	Water Quality Meter Type and #: YSI	Sampling Equipment: peristaltic	Turbidimeter and #: Hanna HI

WELL INFO	Casing ID (in): 2in	Well Volume: ~0.35 gal	Condition of Well: Good
	Initial Depth to Water (ft): 0.0	Total Volume Purged: ~3 gal	Water in Well Vault? No
	Total Well Depth (ft): 52.24	Depth of Pump Intake (ft): 48 from bottom	Well Mouth PID (ppm): NA
	Water Column Thickness (ft): 52.24	Immiscible Layer: Yes (No)	Ambient PID (ppm): NA
	Remarks:		

CASING INFO											
	Casing ID (in) [a]:	1.0	1.5	2.0	2.2	3.0	4.0	4.3	5.0	6.0	7.0
	Unit Casing Volume (gal/lin ft) [b]:	0.04	0.09	0.16	0.20	0.37	0.65	0.75	1.0	1.5	2.0

Date	Time (24 hr)	Water Level (FTOC)	Volume Removed (L)	Pumping Rate (Lpm)	Temp (C)	pH	Cond (mS/cm)	DO (mg/L)	Turb (NTU)	ORP (mv)	Remarks (odor, clarity, etc)
9/9/19	1205	0.0	na	200	12.71	7.12	~~0.535~~ 0.531	0.87	2.2	-58.7	Clear
	1210	0.0	na	200	12.41	7.36	0.522	0.30	2.7	-54.8	
	1215	0.0	na	200	12.57	7.37	0.527	0.27	2.1	-56.7	
	1220	0.0	na	200	12.47	7.37	0.522	0.27	2.0	-66.4	
	1225	0.0	na	200	12.45	7.38	0.523	0.24	2.1	-64.7	
	1230	0.0	na	200	12.48	7.36	0.521	0.21	2.1	-59.2	

Pump Rate: <=0.5 L/min Drawdown: <0.33 ft Measurements: 5 mins Stabilization for 3 consecutive readings

Stabilization: +/-0.5C, +/-0.1 pH, +/-3% Cond, +/- 0.3 mg/L DO, +/-10% Tub (or < 50 NTU), +/- 10 mV ORP

Sample Date/Time: 9/9/19 1230	# of Containers	Container Volume	Container Material	Preservative	Filter (Y/N)	Pump, Bailer, Foot Valve	Duplicate (# of Containers)	MS/MSD (# of Containers)	Parameter(s) and Analytical Method
Laboratory and Chain-of-Custody #: 192010	(3)	40mL	VOA	HCl	N	Pump	(3)	(6)	VOCs
	(3)	40mL	VOA	HCl	N	Pump	(3)	(6)	1,4-Dioxane
	(2)	40mL	VOA	HCl	N	Pump	(3)	(4)	Methane, Ethane, Ethene (MNAs)
ALS	(1)	250mL	Plastic	H2SO4	N	Pump	(1)	(2)	Nitrite/Nitrate (MNAs)
	(1)	500mL	Plastic		N	Pump	(1)	(2)	Chloride, Sulfate, Metals (MNAs)
	(1)	500mL	Plastic	ZnAc	N	Pump	(1)	(2)	Sulfide (MNAs)

Collect COL-GW-06 (MW-53 Dup) Collect COL-GW-05 MS/MSD

Monitoring Well Sample Collection Form

BB&E

LOCATION	Site: SSW Collis	Well ID: MW-56	Date: 9/9/19
	Project: #: LTM SA2 2019 SSW Collis	Sample ID: COL-GW-07	Recorded by: KVB
	Weather Conditions & Barometric Pressure: 70°F, Overcast, 30.05 in Hg		

EQUIPMENT	Purging Equipment: peristaltic	Water Level Indicator: Solinst	PID Type/ID#: NA
	Water Quality Meter Type and #: YSI	Sampling Equipment: peristaltic	Turbidimeter and #: Hanna HI

WELL INFO	Casing ID (in): 2in	Well Volume: ~4.42 gal	Condition of Well: Good
	Initial Depth to Water (ft): 2.35	Total Volume Purged: ~3gal	Water in Well Vault? NO
	Total Well Depth (ft): 30.0	Depth of Pump Intake (ft): 1ft from bottom	Well Mouth PID (ppm): NA
	Water Column Thickness (ft): 27.65	Immiscible Layer: Yes (No)	Ambient PID (ppm): NA
	Remarks:		

CASING INFO											
Casing ID (in) [a]:	1.0	1.5	(2.0)	2.2	3.0	4.0	4.3	5.0	6.0	7.0
Unit Casing Volume (gal/lin ft) [b]:	0.04	0.09	0.16	0.20	0.37	0.65	0.75	1.0	1.5	2.0

Date	Time (24 hr)	Water Level (FTOC)	Volume Removed (L)	Pumping Rate (Lpm)	Temp (C)	pH	Cond (mS/cm)	DO (mg/L)	Turb (NTU)	ORP (mv)	Remarks (odor, clarity, etc)
9/9/19	1330	2.61	na	200	13.37	7.10	0.519	0.61	7.2	-108.9	Clear
	1335	2.66	na	200	13.18	6.99	0.513	0.31	5.6	-105.9	
	1340	2.70	na	200	13.35	6.97	0.513	0.24	3.3	-98.2	
	1345	2.71	na	200	13.26	6.98	0.513	0.23	3.1	-105.6	
↓	1350	2.72	na	200	13.29	6.98	0.514	0.21	3.0	-106.7	

Pump Rate: <=0.5 L/min Drawdown: <0.33 ft Measurements: 5 mins Stabilization for 3 consecutive readings

Stabilization: +/-0.5C, +/-0.1 pH, +/-3% Cond, +/- 0.3 mg/L DO, +/-10% Tub (or < 50 NTU), +/- 10 mV ORP

Sample Date/Time: 9/9/19 1350	# of Containers	Container Volume	Container Material	Preservative	Filter (Y/N)	Pump, Bailer, Foot Valve	Duplicate (# of Containers)	MS/MSD (# of Containers)	Parameter(s) and Analytical Method
Laboratory and Chain-of-Custody #: 192010	(3)	40mL	VOA	HCl	N	Pump			VOCs
	~~3~~	40mL	VOA	HCl	N	Pump			1,4-Dioxane
ALS	~~2~~	40mL	VOA	HCl	N	Pump			Methane, Ethane, Ethene (MNAs)
	~~1~~	250mL	Plastic	H2SO4	N	Pump			Nitrite/Nitrate (MNAs)
	~~1~~	500mL	Plastic		N	Pump			Chloride, Sulfate, Metals (MNAs)
	~~1~~	500mL	Plastic	ZnAc	N	Pump			Sulfide (MNAs)

Monitoring Well Sample Collection Form

BB&E

LOCATION	Site: SSW Collis	Well ID: MW-38	Date: 9/9/19
	Project: #: LTM SA2 2019 SSW Collis	Sample ID: COL-GW- 08	Recorded by: KVB
	Weather Conditions & Barometric Pressure: rain, 65°F, 30.05 in/Hg		

EQUIPMENT	Purging Equipment: peristaltic	Water Level Indicator: Solinst	PID Type/ID#: NA
	Water Quality Meter Type and #: YSI	Sampling Equipment: peristaltic	Turbidimeter and #: Hanna HI

WELL INFO	Casing ID (in): 2in	Well Volume: ~0.88 gal	Condition of Well: Good
	Initial Depth to Water (ft): 4.44	Total Volume Purged: ~2 gal	Water in Well Vault? NO
	Total Well Depth (ft): 9.95	Depth of Pump Intake (ft): 4ft from bottom	Well Mouth PID (ppm): NA
	Water Column Thickness (ft): 5.51	Immiscible Layer: Yes (No)	Ambient PID (ppm): NA
	Remarks:		

CASING INFO											
Casing ID (in) [a]:	1.0	1.5	(2.0)	2.2	3.0	4.0	4.3	5.0	6.0	7.0
Unit Casing Volume (gal/lin ft) [b]:	0.04	0.09	(0.16)	0.20	0.37	0.65	0.75	1.0	1.5	2.0

Date	Time (24 hr)	Water Level (FTOC)	Volume Removed (L)	Pumping Rate (Lpm)	Temp (C)	pH	Cond (mS/cm)	DO (mg/L)	Turb (NTU)	ORP (mv)	Remarks (odor, clarity, etc)
9/9/19	1405	4.51	na	200	19.37	7.09	1.072	0.71	2.9	-24.8	Clear
	1410	4.52	na	200	19.59	6.96	1.079	0.40	2.6	-25.3	
	1415	4.52	na	200	19.63	6.94	1.090	0.26	2.2	-32.0	
	1420	4.52	na	200	19.41	6.92	1.101	0.36	2.2	-35.4	
	1425	4.53	na	200	19.20	6.91	1.111	0.30	2.1	-39.9	
	1430	4.53	na	200	19.19	6.91	1.117	0.31	2.1	-42.7	

Pump Rate: <=0.5 L/min Drawdown: <0.33 ft Measurements: 5 mins Stabilization for 3 consecutive readings

Stabilization: +/-0.5C, +/-0.1 pH, +/-3% Cond, +/- 0.3 mg/L DO, +/-10% Tub (or < 50 NTU), +/- 10 mV ORP

Sample Date/Time: 1430 9/9/19	# of Containers	Container Volume	Container Material	Preservative	Filter (Y/N)	Pump, Bailer, Foot Valve	Duplicate (# of Containers)	MS/MSD (# of Containers)	Parameter(s) and Analytical Method
Laboratory and Chain-of-Custody #: 192010	(3)	40mL	VOA	HCl	N	Pump			VOCs
	~~3~~	40mL	VOA	HCl	N	Pump			1,4-Dioxane
ALS	~~2~~	40mL	VOA	HCl	N	Pump			Methane, Ethane, Ethene (MNAs)
	1	250mL	Plastic	H2SO4	N	Pump			Nitrite/Nitrate (MNAs)
	1	500mL	Plastic		N	Pump			Chloride, Sulfate, Metals (MNAs)
	1	500mL	Plastic	ZnAc	N	Pump			Sulfide (MNAs)

Monitoring Well Sample Collection Form

BB&E

LOCATION	Site: SSW Collis		Well ID: MW-43	Date: 9/9/19	
	Project: #: LTM SA2 2019 SSW Collis		Sample ID: COL-GW-09	Recorded by: KVB	
	Weather Conditions & Barometric Pressure: 85°F; 30.03 in Hg, overcast				
EQUIPMENT	Purging Equipment: peristaltic		Water Level Indicator: Solinst	PID Type/ID#: NA	
	Water Quality Meter Type and #: YSI		Sampling Equipment: peristaltic	Turbidimeter and #: Hanna HI	
WELL INFO	Casing ID (in): 2in		Well Volume: ~ 15.9 gal	Condition of Well: Good	
	Initial Depth to Water (ft): Lift		Total Volume Purged: ~2.5 gal	Water in Well Vault? NO	
	Total Well Depth (ft): 99.38		Depth of Pump Intake (ft): Lift from bottom	Well Mouth PID (ppm): NA	
	Water Column Thickness (ft): 99.38		Immiscible Layer: Yes (No)	Ambient PID (ppm): NA	
	Remarks:				

CASING INFO											
Casing ID (in) [a]:	1.0	1.5	(2.0)	2.2	3.0	4.0	4.3	5.0	6.0	7.0
Unit Casing Volume (gal/lin ft) [b]:	0.04	0.09	(0.16)	0.20	0.37	0.65	0.75	1.0	1.5	2.0

Date	Time (24 hr)	Water Level (FTOC)	Volume Removed (L)	Pumping Rate (Lpm)	Temp (C)	pH	Cond (mS/cm)	DO (mg/L)	Turb (NTU)	ORP (mv)	Remarks (odor, clarity, etc)
9/9/19	1435	Lift	na	200	17.68	7.66	0.555	0.28	1.6	-130.3	Clear
	1440	Lift	na	200	17.78	7.70	0.547	0.20	1.2	-131.5	
	1445	Lift	na	200	17.90	7.73	0.541	0.17	1.1	-130.9	
	1450	Lift	na	200	17.89	7.75	0.538	0.15	1.1	-127.6	
	1455	Lift	na	200	17.89	7.76	0.537	0.13	1.0	-126.8	

Pump Rate: <=0.5 L/min Drawdown: <0.33 ft Measurements: 5 mins Stabilization for 3 consecutive readings

Stabilization: +/-0.5C, +/-0.1 pH, +/-3% Cond, +/- 0.3 mg/L DO, +/-10% Tub (or < 50 NTU), +/- 10 mV ORP

Sample Date/Time: 1455 9/9/19	# of Containers	Container Volume	Container Material	Preservative	Filter (Y/N)	Pump, Bailer, Foot Valve	Duplicate (# of Containers)	MS/MSD (# of Containers)	Parameter(s) and Analytical Method
Laboratory and Chain-of-Custody #: 192010 ALS	(3)	40mL	VOA	HCl	N	Pump			VOCs
	~~3~~	40mL	VOA	HCl	N	Pump			1,4-Dioxane
	~~2~~	40mL	VOA	HCl	N	Pump			Methane, Ethane, Ethene (MNAs)
	~~1~~	250mL	Plastic	H2SO4	N	Pump			Nitrite/Nitrate (MNAs)
	~~1~~	500mL	Plastic		N	Pump			Chloride, Sulfate, Metals (MNAs)
	~~1~~	500mL	Plastic	ZnAc	N	Pump			Sulfide (MNAs)

Monitoring Well Sample Collection Form

BB&E

LOCATION	Site: SSW Collis	Well ID: MW-50	Date: 9/9/19
	Project #: LTM SA2 2019 SSW Collis	Sample ID: COL-GW- 10	Recorded by: KVB
	Weather Conditions & Barometric Pressure: 70°F, overcast, 30.05 in/Hg		

EQUIPMENT	Purging Equipment: peristaltic	Water Level Indicator: Solinst	PID Type/ID#: NA
	Water Quality Meter Type and #: YSI	Sampling Equipment: peristaltic	Turbidimeter and #: Hanna HI

WELL INFO	Casing ID (in): 2in	Well Volume: ~3.4 gal	Condition of Well: Good
	Initial Depth to Water (ft): 3.54	Total Volume Purged: ~3.5 gal	Water in Well Vault? no
	Total Well Depth (ft): 24.77	Depth of Pump Intake (ft): 4ft from bottom	Well Mouth PID (ppm): NA
	Water Column Thickness (ft): 21.23	Immiscible Layer: Yes (No)	Ambient PID (ppm): NA
	Remarks:		

CASING INFO											
Casing ID (in) [a]:	1.0	1.5	(2.0)	2.2	3.0	4.0	4.3	5.0	6.0	7.0
Unit Casing Volume (gal/lin ft) [b]:	0.04	0.09	0.16	0.20	0.37	0.65	0.75	1.0	1.5	2.0

Date	Time (24 hr)	Water Level (FTOC)	Volume Removed (L)	Pumping Rate (Lpm)	Temp (C)	pH	Cond (mS/cm)	DO (mg/L)	Turb (NTU)	ORP (mv)	Remarks (odor, clarity, etc)
9/9/19	1520	3.55	na	200	18.74	8.26	0.207	1.53	1.6	-30.9	clear
	1525	3.56	na	200	15.95	7.93	0.122	0.61	1.4	-33.4	
	1530	3.57	na	200	15.54	7.06	0.844	0.25	1.4	14.1	
	1535	3.58	na	200	15.56	6.98	1.037	0.30	1.4	18.1	
	1540	3.58	na	200	15.50	6.97	1.634	0.24	1.4	6.97	
	1545	3.58	na	200	15.71	7.01	1.736	0.21	1.4	-49.8	
	1550	3.58	na	200	15.61	7.03	1.766	0.18	1.3	-55.2	
	1555	3.58	na	200	15.63	7.04	1.785	0.19	1.3	-56.3	
	1600	3.58	na	200	15.54	7.04	1.805	0.18	1.3	-57.4	

Pump Rate: <=0.5 L/min Drawdown: <0.33 ft Measurements: 5 mins Stabilization for 3 consecutive readings

Stabilization: +/-0.5C, +/-0.1 pH, +/-3% Cond, +/- 0.3 mg/L DO, +/-10% Tub (or < 50 NTU), +/- 10 mV ORP

Sample Date/Time: 1000 9/9/19	# of Containers	Container Volume	Container Material	Preservative	Filter (Y/N)	Pump, Bailer, Foot Valve	Duplicate (# of Containers)	MS/MSD (# of Containers)	Parameter(s) and Analytical Method
Laboratory and Chain-of-Custody #: 192012	(3)	40mL	VOA	HCl	N	Pump			VOCs
	~~3~~	40mL	VOA	HCl	N	Pump			1,4-Dioxane
ALS	2	40mL	VOA	HCl	N	Pump			Methane, Ethane, Ethene (MNAs)
	1	250mL	Plastic	H2SO4	N	Pump			Nitrite/Nitrate (MNAs)
	1	500mL	Plastic		N	Pump			Chloride, Sulfate, Metals (MNAs)
	1	500mL	Plastic	ZnAc	N	Pump			Sulfide (MNAs)

Monitoring Well Sample Collection Form

BB&E

LOCATION	Site: SSW Collis	Welll ID: MW-505	Date: 9/9/19
	Project: #: LTM SA2 2019 SSW Collis	Sample ID: COL-GW- 11	Recorded by: KVB
	Weather Conditions & Barometric Pressure: 70 °F, Overcast, 30.05 inHg		

EQUIPMENT	Purging Equipment: Peristaltic	Water Level Indicator: Solinst	PID Type/ID#: NA
	Water Quality Meter Type and #: YSI	Sampling Equipment: Peristaltic	Turbidimeter and #: Hanna HI

WELL INFO	Casing ID (in): 2in	Well Volume: ~1.38gal	Condition of Well: Good
	Initial Depth to Water (ft): 3.61	Total Volume Purged: ~2gal	Water in Well Vault? NO
	Total Well Depth (ft): 12.28	Depth of Pump Intake (ft): 4ft from bottom	Well Mouth PID (ppm): NA
	Water Column Thickness (ft): 8.67	Immiscible Layer: Yes (No)	Ambient PID (ppm): NA
	Remarks:		

CASING INFO											
Casing ID (in) [a]:	1.0	1.5	(2.0)	2.2	3.0	4.0	4.3	5.0	6.0	7.0
Unit Casing Volume (gal/lin ft) [b]:	0.04	0.09	0.16	0.20	0.37	0.65	0.75	1.0	1.5	2.0

Date	Time (24 hr)	Water Level (FTOC)	Volume Removed (L)	Pumping Rate (Lpm)	Temp (C)	pH	Cond (mS/cm)	DO (mg/L)	Turb (NTU)	ORP (mv)	Remarks (odor, clarity, etc)
9/9/19	1610	3.63	na	200	17.15	7.26	0.937	0.80	1.6	-74.6	Clear
	1615	3.63	na	200	17.14	7.18	0.975	0.41	1.4	-78.4	
	1620	3.64	na	200	17.12	7.16	0.009	0.28	1.2	-80.1	
	1625	3.65	na	200	17.10	7.16	0.029	0.29	1.1	-77.1	
✓	1630	3.65	na	200	17.11	7.10	1.040	0.25	1.1	-74.4	

Pump Rate: <=0.5 L/min Drawdown: <0.33 ft Measurements: 5 mins Stabilization for 3 consecutive readings

Stabilization: +/-0.5C, +/-0.1 pH, +/-3% Cond, +/- 0.3 mg/L DO, +/-10% Tub (or < 50 NTU), +/- 10 mV ORP

Sample Date/Time: 1630 9/9/19	# of Containers	Container Volume	Container Material	Preservative	Filter (Y/N)	Pump, Bailer, Foot Valve	Duplicate (# of Containers)	MS/MSD (# of Containers)	Parameter(s) and Analytical Method
Laboratory and Chain-of-Custody #: 192012	3	40mL	VOA	HCl	N	Pump			VOCs
	~~3~~	40mL	VOA	HCl	N	Pump			1,4-Dioxane
ALS	~~2~~	40mL	VOA	HCl	N	Pump			Methane, Ethane, Ethene (MNAs)
	~~1~~	250mL	Plastic	H2SO4	N	Pump			Nitrite/Nitrate (MNAs)
	~~1~~	500mL	Plastic		N	Pump			Chloride, Sulfate, Metals (MNAs)
	1	500mL	Plastic	ZnAc	N	Pump			Sulfide (MNAs)

Monitoring Well Sample Collection Form

BB&E

LOCATION	Site: SSW Collis		Welll ID: MW-42	Date: 9/10 /19	
	Project: #: LTM SA2 2019 SSW Collis		Sample ID: COL-GW-42	Recorded by: KVB	
	Weather Conditions & Barometric Pressure: 75°F, Sun, 30.01 in/Hg				
EQUIPMENT	Purging Equipment: Peristaltic		Water Level Indicator: Solinst	PID Type/ID#: NA	
	Water Quality Meter Type and #: YSI		Sampling Equipment: Peristaltic	Turbidimeter and #: Hanna 41	
WELL INFO	Casing ID (in): 2in		Well Volume: ~7.264	Condition of Well: Good	
	Initial Depth to Water (ft): 4.80		Total Volume Purged: ~2.5 gal	Water in Well Vault? No	
	Total Well Depth (ft): 50.2		Depth of Pump Intake (ft): 44ft from bottom	Well Mouth PID (ppm): NA	
	Water Column Thickness (ft): 45.4		Immiscible Layer: Yes (No)	Ambient PID (ppm): NA	
	Remarks:				

CASING INFO											
Casing ID (in) [a]:	1.0	1.5	(2.0)	2.2	3.0	4.0	4.3	5.0	6.0	7.0
Unit Casing Volume (gal/lin ft) [b]:	0.04	0.09	0.16	0.20	0.37	0.65	0.75	1.0	1.5	2.0

Date	Time (24 hr)	Water Level (FTOC)	Volume Removed (L)	Pumping Rate (Lpm)	Temp (C)	pH	Cond (mS/cm)	DO (mg/L)	Turb (NTU)	ORP (mv)	Remarks (odor, clarity, etc)
9/10/19	0745	4.82	na	200	16.50	8.01	0.737	1.60	1.6	-85.0	Clear
	0750	4.86	na	200	16.25	7.39	0.809	0.58	1.4	-76.4	
	0755	4.87	na	200	16.05	7.23	0.827	0.46	1.2	-69.6	
	0800	4.88	na	200	16.05	7.20	0.840	0.56	1.1	-55.8	
	0805	4.89	na	200	15.99	7.18	0.846	0.47	1.1	-51.0	
	0810	4.88	na	200	16.08	7.18	0.852	0.36	1.0	-46.8	
	0815	4.89	na	200	16.05	7.19	0.851	0.39	1.0	-45.2	

Pump Rate: <=0.5 L/min Drawdown: <0.33 ft Measurements: 5 mins Stabilization for 3 consecutive readings

Stabilization: +/-0.5C, +/-0.1 pH, +/-3% Cond, +/- 0.3 mg/L DO, +/-10% Tub (or < 50 NTU), +/- 10 mV ORP

Sample Date/Time: 0815 9/10/19	# of Containers	Container Volume	Container Material	Preservative	Filter (Y/N)	Pump, Bailer, Foot Valve	Duplicate (# of Containers)	MS/MSD (# of Containers)	Parameter(s) and Analytical Method
Laboratory and Chain-of-Custody #: 192012 ALS	(3)	40mL	VOA	HCl	N	Pump			VOCs
	(3)	40mL	VOA	HCl	N	Pump			1,4-Dioxane
	(3)	40mL	VOA	HCl	N	Pump			Methane, Ethane, Ethene (MNAs)
	(1)	250mL	Plastic	H2SO4	N	Pump			Nitrite/Nitrate (MNAs)
	(1)	500mL	Plastic		N	Pump			Chloride, Sulfate, Metals (MNAs)
	(1)	500mL	Plastic	ZnAc	N	Pump			Sulfide (MNAs)

Monitoring Well Sample Collection Form

BB&E

LOCATION	Site: SSW Collis	Well ID: MW-34	Date: 9/ 10/19
	Project: #: LTM SA2 2019 SSW Collis	Sample ID: COL-GW- 13	Recorded by: KVB
	Weather Conditions & Barometric Pressure: 80°F, sun, 30.01 inHg		

EQUIPMENT	Purging Equipment: peristaltic	Water Level Indicator: Solinst	PID Type/ID#: NA
	Water Quality Meter Type and #: YSI	Sampling Equipment: peristaltic	Turbidimeter and #: Hanna #1

WELL INFO	Casing ID (in): 2in	Well Volume: ~4.20	Condition of Well: Good
	Initial Depth to Water (ft): 5.34	Total Volume Purged: ~2gal	Water in Well Vault? No
	Total Well Depth (ft): 31.6	Depth of Pump Intake (ft): 24ft from bottom	Well Mouth PID (ppm): NA
	Water Column Thickness (ft): 26.26	Immiscible Layer: Yes (No)	Ambient PID (ppm): NA
	Remarks:		

CASING INFO											
Casing ID (in) [a]:	1.0	1.5	(2.0)	2.2	3.0	4.0	4.3	5.0	6.0	7.0
Unit Casing Volume (gal/lin ft) [b]:	0.04	0.09	0.16	0.20	0.37	0.65	0.75	1.0	1.5	2.0

Date	Time (24 hr)	Water Level (FTOC)	Volume Removed (L)	Pumping Rate (Lpm)	Temp (C)	pH	Cond (mS/cm)	DO (mg/L)	Turb (NTU)	ORP (mv)	Remarks (odor, clarity, etc)
9/10/19	0835	5.39	na	200	18.11	7.16	0.821	1.10	3.7	-61.0	clear
	0840	5.41	na	200	17.50	7.14	0.796	0.40	2.6	-75.4	
	0845	5.44	na	200	17.38	7.13	0.790	0.32	1.7	-74.3	
	0850	5.48	na	200	~~16.53~~ 17.17	7.12	0.774	0.32	1.4	-73.0	
	0855	5.49	na	200	16.29	7.11	0.769	0.33	1.4	-66.2	
↓	0900	5.50	na	200	16.28	7.11	0.766	0.32	1.4	-65.7	

Pump Rate: <=0.5 L/min Drawdown: <0.33 ft Measurements: 5 mins Stabilization for 3 consecutive readings
Stabilization: +/-0.5C, +/-0.1 pH, +/-3% Cond, +/- 0.3 mg/L DO, +/-10% Tub (or < 50 NTU), +/- 10 mV ORP

Sample Date/Time: 0900 9/10/19	# of Containers	Container Volume	Container Material	Preservative	Filter (Y/N)	Pump, Bailer, Foot Valve	Duplicate (# of Containers)	MS/MSD (# of Containers)	Parameter(s) and Analytical Method
Laboratory and Chain-of-Custody #: 192112	(3)	40mL	VOA	HCl	N	Pump			VOCs
	(3)	40mL	VOA	HCl	N	Pump			1,4-Dioxane
	(3)	40mL	VOA	HCl	N	Pump			Methane, Ethane, Ethene (MNAs)
ALS	(1)	250mL	Plastic	H2SO4	N	Pump			Nitrite/Nitrate (MNAs)
	(1)	500mL	Plastic		N	Pump			Chloride, Sulfate, Metals (MNAs)
	(1)	500mL	Plastic	ZnAc	N	Pump			Sulfide (MNAs)

Monitoring Well Sample Collection Form

BB&E

LOCATION	Site: SSW Collis	Welll ID: MW-39	Date: 9/10/19
	Project: #: LTM SA2 2019 SSW Collis	Sample ID: COL-GW- 14	Recorded by: KVB
	Weather Conditions & Barometric Pressure:		

EQUIPMENT	Purging Equipment: peristaltic	Water Level Indicator: solinst	PID Type/ID#: NA
	Water Quality Meter Type and #: YSI	Sampling Equipment: peristaltic	Turbidimeter and #: Hanna HI

WELL INFO	Casing ID (in): 2in	Well Volume: ~1.60 gal	Condition of Well: Good
	Initial Depth to Water (ft): ~3.10	Total Volume Purged: ~2 gal	Water in Well Vault? NO
	Total Well Depth (ft): 13.91	Depth of Pump Intake (ft): 4ft from bottom	Well Mouth PID (ppm): NA
	Water Column Thickness (ft): 9.81	Immiscible Layer: Yes (No)	Ambient PID (ppm): NA
	Remarks:		

CASING INFO											
Casing ID (in) [a]:	1.0	1.5	(2.0)	2.2	3.0	4.0	4.3	5.0	6.0	7.0
Unit Casing Volume (gal/lin ft) [b]:	0.04	0.09	(0.16)	0.20	0.37	0.65	0.75	1.0	1.5	2.0

Date	Time (24 hr)	Water Level (FTOC)	Volume Removed (L)	Pumping Rate (Lpm)	Temp (C)	pH	Cond (mS/cm)	DO (mg/L)	Turb (NTU)	ORP (mv)	Remarks (odor, clarity, etc)
9/10/19	0920	4.12	na	200	18.27	6.99	2.011	1.95	4.2	-41.2	Clear
	0925	4.12	na	200	17.72	6.87	2.047	0.73	4.0	-43.7	
	0930	4.12	na	200	17.87	6.83	2.060	0.38	3.6	-42.8	
	0935	4.14	na	200	17.72	6.82	2.052	0.24	3.1	-42.5	
	0940	4.15	na	200	17.68	6.82	2.012	0.25	2.6	-43.3	
	0945	4.15	na	200	17.70	6.82	2.011	0.23	2.2	-43.6	

Pump Rate: <=0.5 L/min Drawdown: <0.33 ft Measurements: 5 mins Stabilization for 3 consecutive readings
Stabilization: +/-0.5C, +/-0.1 pH, +/-3% Cond, +/- 0.3 mg/L DO, +/-10% Tub (or < 50 NTU), +/- 10 mV ORP

Sample Date/Time: 0945 9/10/19	# of Containers	Container Volume	Container Material	Preservative	Filter (Y/N)	Pump, Bailer, Foot Valve	Duplicate (# of Containers)	MS/MSD (# of Containers)	Parameter(s) and Analytical Method
Laboratory and Chain-of-Custody #: 192012	(3)	40mL	VOA	HCl	N	Pump	(3)		VOCs
	3	40mL	VOA	HCl	N	Pump	-		1,4-Dioxane
	2	40mL	VOA	HCl	N	Pump	-		Methane, Ethane, Ethene (MNAs)
ALS	1	250mL	Plastic	H2SO4	N	Pump	-		Nitrite/Nitrate (MNAs)
	1	500mL	Plastic		N	Pump	-		Chloride, Sulfate, Metals (MNAs)
	1	500mL	Plastic	ZnAc	N	Pump	-		Sulfide (MNAs)

↑ collect COL-GW-15 (MW-39 Dup)

ATTACHMENT C

GRAVEL LOT INSPECTION

SEMI-ANNUAL INSPECTION RECORD
Media Management Plan
Collis, Inc. Property
Clinton, Iowa

Inspection performed by: KWB

Date: 9/10/19

Weather: 75°F, Sun

1) **Gravel Truck Lot**

See attached figure for area to be inspected. Inspect gravel condition and list observations below. Take photographs showing overall condition of the lot and gravel coverage, including close-up photographs detailing specific observations.

1) Inspect for evidence of excessive erosion. If excessive erosion is observed, document necessary corrective measures (e.g., regrading, placement of new gravel, etc.).

None

2) Inspect for evidence of burrowing animals. If evidence of burrowing animals observed, document necessary corrective measures (e.g., filling of burrow holes, etc.).

None

3) Inspect for areas of poor drainage or ponding. If evidence of poor drainage or ponding are observed, document necessary corrective measures (e.g., regrading, placement of new gravel, etc.).

None

4) Inspect for bare areas (either no gravel cover or no vegetation). If bare areas are observed, document necessary corrective measures (e.g., placement of new gravel).

None

Additional/Other Maintenance needed? Yes____ No X

Location/explanation:

Corrective measures must be completed within **60 days** of discovery (weather permitting) and documented evidence of corrective measures implementation must be provided to BB&E as part of the certification process.

Follow-up Inspection (after repair):

Performed by: _____

Date: _____

Attachment C
Gravel Lot Inspection
September 2019

Photo 1

Photo 2

Attachment C
Gravel Lot Inspection
September 2019

Photo 3

Photo 4

Attachment C
Gravel Lot Inspection
September 2019

Photo 5

Photo 6

Attachment C
Gravel Lot Inspection
September 2019

Photo 7

Photo 8

Attachment C
Gravel Lot Inspection
September 2019

Photo 9